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MONTHLY WEATHER REVIEW

MARCH, 1932

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UNITED STATES DEPARTMENT OF AGRICULTURE

WEATHER BUREAU

WASHINGTON, D. C.

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CORRECTIONS

Volume 60, February, 1932:

Page 47, second column, fifth line from foot of page, "magnetor" should be "magneto."

Page 48, second column, Equation 6, insert minus sign in front of the "*W*."

Page 49, second column, third and fourth lines under the illustration, for "*minimum*" and "*maximum*" substitute "*limiting*."

Page 53, second column, second equation from bottom of page, the denominator "$1+\frac{1.314}{W}$" should be: "$1+\frac{2.938}{W}$."

Page 56, Table 4, fifth column, the boxhead should contain simply "*b*."

MONTHLY WEATHER REVIEW

Editor, W. J. HUMPHREYS

VOL. 60, No. 3
W. B. No. 1075

MARCH, 1932

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IMPORTANT NOTICE

Owing to the necessity of drastically reducing the printing cost of the REVIEW to keep within the funds for the fiscal year, now drawing to a close, all "contributions" are omitted in this issue. It may be necessary to follow the same procedure in the next number also. However, it is hoped that "contributions" may be restored beginning with the May REVIEW.—Editor.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Ficker, Heinrich von.
Wetter und Wetterentwicklung. Berlin. 1932. 5,139 p. illus. diagrs. 18½ cm.

Fuess, R.
Messinstrumente für Luftdruck, Temperatur und Feuchtigkeit, sowie Prüfgeräte und Thermometerhütten. Berlin. n. d. v. p. illus. 23 cm.
Messinstrumente für Wind, Niederschlag, Verdunstung, Strahlung und Sicht. Berlin. n. d. v. p. illus. 23 cm.

Lindskog, Erik.
On the geographical distribution of fog in Sweden. [Stockholm. 1931.] 94 p. figs. 24½ cm. (Geogr. annaler. H. 1. 1931.)

Lunelund, Harald.
Registrierung der Abkühlungsgrösse in Helsingfors. Helsingfors. n. d. 37 p. 24 cm. (Soc. scient. Fenn. Comment. physico-math. VI. 1.)
Registrierung der Sonnen- und Himmelsstrahlung in Helsingfors während der Zeit 1. Dezember 1928-31. Dezember 1929. Helsingfors. n. d. 56 p. 24 cm. (Soc. scient. Fenn. Comment. physico-math. V. 18.)

Lunelund, Harald—Continued.
Über die Tageshelligkeit in Finnland. Helsingfors. n. d. 34 p. figs. 24 cm. (Soc. scient Fenn. Comment. physico-math. IV. 23.)

Lumelund, Harald, & Holmberg, K. T.
Über die ultraviolette Sonnenstrahlung in Finnland. Helsingfors. n. d. 41 p. figs. 24 cm. (Soc. scient. Fenn. Comment. physico-math. V. 2.)

Negretti & Zambra.
Standard meteorological instruments. [Bolton. c...?.] 139 p. illus. 25½ cm.

Ridgley, Douglas C., & Koeppe, Clarence E.
Fundamentals of climate. Bloomington. c1932. 63 p. figs. 26½ cm.

Rossby, C[arl] G[ustaf.]
Thermodynamics applied to air mass analysis. Cambridge. 1932. 41 p. figs. tables. plates. 28 cm. (Mass. inst. tech., Met'l papers. v. 1, no. 3.)

Theodorsen, Theodore, & Clay, William C.
Ice prevention on aircraft by means of engine exhaust heat and a technical study of heat transmission from a Clark Y airfoil. Washington. 1932. 24 p. illus. 29 cm. (Nat. adv. comm. aeron., Report no. 403.)

Schmidt, Wilhelm.
Meteorologische Feldversuche über Frostabwehrmittel. Oppenheim a. Rh. n. d. 103 p. figs. plates (fold.) 22½ cm. (Fröste und Frostebekämpfung im Weinbau. Heft 4.)

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING MARCH, 1932

By HERBERT H. KIMBALL, in charge Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1932, REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged above the normal intensity for March at all three stations.

Table 2 shows an excess in the total solar radiation received on a horizontal surface at all stations except Twin Falls, although the excess is slight at Lincoln.

At Madison, no skylight polarization measurements were obtained during the month, as reflection from ice on the surface of the lake was a disturbing element. At Washington, measurements made on the 29th and 30th gave a mean of 58 per cent and a maximum of 64 per cent, which are average values for March at Washington.

Table 3 summarizes solar radiation measurements I_y and I_r, obtained by means of the yellow and red glass filters described in the February, 1932, REVIEW, and values of the coefficient of atmospheric turbidity derived therefrom.

118266—32——1

TABLE 1.—*Solar radiation intensities during March, 1932*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Mar. 1	3.00	0.97	1.07	1.20	1.33	1.50					3.30
Mar. 3	5.36			0.92	1.09	1.35					4.75
Mar. 5	4.95	0.79	0.92	1.04	1.25	1.46					4.17
Mar. 7	1.24		0.96	1.10	1.29	1.46					1.45
Mar. 8	1.02		0.98	1.13	1.28	1.50					1.12
Mar. 16	1.88			0.95							1.96
Mar. 24	4.75		0.55	0.74	0.83						3.00
Mar. 25	4.57					1.35					3.39
Mar. 29	4.37				1.18						3.00
Mar. 30	4.75		0.73	0.88	1.15	1.38					3.81
Means		(0.88)	0.87	1.00	1.18	1.43					
Departures		+0.15	+0.06	+0.05	+0.03	±0.00					
Madison, Wis.											
Mar. 7	0.74		1.06	1.21	1.42	1.60	1.37	1.18			0.74
Mar. 10	0.86		1.13	1.26	1.43	1.65	1.43	1.25			1.12
Mar. 11	1.12		1.11	1.24	1.42	1.58	1.32	1.22			1.19
Mar. 12	1.19		1.11	1.23	1.44	1.59					1.32
Mar. 14	1.32		1.16	1.29	1.42	1.64					1.32

[1] Extrapolated.

TABLE 1.—*Solar radiation intensities during March, 1932*—Con.

Madison, Wis.—Continued

Date	Sun's zenith distance: Sa. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Mar. 17	2.46					1.47	1.23	1.08			2.49
Mar. 22	1.95			1.26	1.37		1.34				1.88
Mar. 23	3.00					1.55					2.16
Mar. 31	2.26				1.28						1.78
Means			1.11	1.25	1.40	1.58	1.34	1.18			
Departures			+0.07	+0.08	+0.08	+0.01	+0.04	+0.01			
Lincoln, Nebr.											
Mar. 5	1.12			1.29	1.46	1.65					1.37
Mar. 8	0.56	1.03									0.96
Mar. 10	1.07	0.91	0.95	1.08	1.35						1.32
Mar. 12	1.32	1.01	1.13	1.27	1.46						1.52
Mar. 19	4.87				1.20						4.95
Mar. 23	2.62	0.91	0.98	1.02	1.31	1.59					3.15
Mar. 24	4.75	0.71	0.85	1.03	1.29	1.46	1.24	1.07			4.57
Mar. 26	4.17	0.81									3.81
Mar. 28	4.17				1.29	1.46					3.99
Mar. 29	4.57	0.62	0.80								5.16
Mar. 30	3.15						1.34				2.87
Mar. 31	3.81						1.24	1.04			2.64
Means		0.86	0.94	1.14	1.34	1.54	1.27	(1.06)			
Departures		+0.02	+0.01	+0.05	+0.07	−0.02	−0.01	−0.03			

TABLE 2.—*Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface)*

Week beginning	Gram calories per square centimeter: Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Gainesville	Miami	New Orleans
1932	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Feb. 26	268	202	241	198	231	418	209	157	309	[1] 320	492	474	264
Mar. 4	305	385	392	290	294	416	180	143	282	401	[1] 272	439	282
Mar. 11	367	388	378	267	368	339	219	202	316	361	[2] 466	499	244
Mar. 18	418	288	381	152	311	499	284	240	289	393	405	439	329
Mar. 25	303	369	482	274	251	530	282	258	298	444	[1] 526	509	263
	Departures from weekly normals												
Feb. 26	−19	−81	−98	+6	−2	+44	+33	----------	+16	−28	+109	+94	----------
Mar. 4	−11	+84	+38	+90	+32	+41	−20	----------	−22	+54	−114	+35	----------
Mar. 11	+38	+69	+2	+59	+94	−53	−7	----------	−4	+13	+85	+67	----------
Mar. 18	+59	−31	−16	−68	+39	+49	+44	----------	−48	+16	−10	−18	----------
Mar. 25	−43	+6	+75	+30	−22	+42	+36	----------	−56	+36	+21	+34	----------
	Accumulated departures on Mar. 31												
	−553	−1,456	−910	+1,470	+1,435	+1,267	+693	----------	−847	+2,093	----------	+4,081	----------

[1] 6-day mean.

[2] 4-day mean.

TABLE 3.—*Screened solar radiation measurements and determinations of the atmospheric turbidity factor, β. Washington, D. C., March, 1932*

[Values in italics have been interpolated]

Date and solor hour angle	Solar altitude, h.	Air mass, m.	I_m	I_y	I_r	β	Blueness of sky	Atmospheric dust particles per cubic centimeter	Notes
Mar. 1	° ′		gr. cal.	gr. cal.	gr. cal.				
4:28 a.	12-42	4.54	1.019	*0.797*	0.668	0.040		273	
4:09 a.	16-07	3.57	1.116	.866	*.713*	.052			
4:02 a.	17-20	3.31	1.142	*.875*	.720	.049			
3:10 a.	26-01	2.28	1.282	.928	*.747*	.048			
3:04 a.	26-58	2.21	1.295	*.931*	.729	.039	5		Many Fr. Cu.
0:52 a.	42-06	1.49	1.407	*1.017*	.809	.078			Stopped by clouds.
0:49 a.	42-24	1.48	1.398	1.017	*.811*	.083			
Mar. 3									
3:54 a.	19-24	2.99	.921	*.712*	.568	.083		1,014	
3:28 a.	23-49	2.46	1.036	*.728*	.612	.078			
2:44 a.	30-44	1.95	1.098	*.786*	.643	.100	4		
2:38 a.	31-33	1.90	1.075	.788	*.643*	.126			
0:50 a.	42-57	1.47	1.201	*.872*	.694	.127			
0:42 a.	43-20	1.46	1.226	.878	*.694*	.112			
Mar. 5									
4:18 a.	15-30	3.74	.944	*.724*	.605	.060		488	
3:46 a.	21-10	2.76	1.062	.805	*.648*	.062			
3:42 a.	22-02	2.65	1.086	*.812*	.665	.070			
2:53 a.	29-56	2.00	1.250	*.906*	.735	.068			
2:47 a.	30-50	1.94	1.260	.917	*.744*	.072			
1:38 a.	39-45	1.56	1.331	.944	*.774*	.085			Stopped by clouds.
1:32 a.	40-21	1.54	1.347	*.946*	.775	.080			
Mar. 8									
4:18 a.	16-16	3.54	1.050	*.818*	.676	.058		502	
4:14 a.	17-11	3.35	1.078	.825	*.690*	.060			
3:36 a.	23-45	2.48	1.195	.888	*.722*	.062			
3:31 a.	24-40	2.38	1.206	*.892*	.728	.065			
2:59 a.	29-52	2.01	1.271	.925	*.748*	.068			
2:54 a.	30-24	1.96	1.290	*.927*	.749	.065			
1:35 a.	41-06	1.52	1.408	*.959*	.779	.060			
1:30 a.	41-34	1.50	1.350	.961	*.789*	.095			
0:19 p.	46-06	1.39	1.399	.919	*.746*	.052			
0:24 p.	45-59	1.39	1.384	*.917*	.731	.048			
Mar. 23									
3:47 a.	26-00	2.28	1.177	*0.874*	0.710	0.075		873	Cl. clouds disappearing.
3:40 a.	27-11	2.19	1.183	.877	*.715*	.080			
2:19 a.	40-40	1.53	1.280	*.929*	.731	.095			
2:11 a.	40-49	1.50	1.315	.934	*.734*	.080			
0:29 a.	51-40	1.27	1.334	*.971*	.748	.105			
0:22 a.	51-55	1.27	1.318	.920	*.715*	.090			
Mar. 24									
4:48 a.	14-54	3.84	.563	*.486*	.396	.145		2058	
4:24 a.	19-29	2.98	.737	.674	*.469*	.125			
4:18 a.	20-31	2.83	.735	*.618*	.495	.155			
3:41 a.	27-25	2.16	.757	.674	*.567*				
2:38 a.	38-15	1.62	1.040	.758	*.614*	.150			
2:34 a.	38-48	1.60	1.016	*.760*	.612	.180			
Mar. 25									
0:38 a.	52-02	1.27	1.243	.886	*.709*	.072		1432	
0:34 a.	52-14	1.27	1.242	*.886*	.710	.074			
Mar. 29									
3:38 a.	29-23	2.04	1.170	*.848*	.705	.092	6	691	
3:32 a.	30-16	1.98	1.181	.858	*.709*	.092			
Mar. 30									
4:53 a.	15-28	3.70	.775	*.581*	.491	.080	4	792	
4:46 a.	16-44	3.44	.809	*.607*	*.501*	.080			
4:10 a.	23-34	2.49	1.020	*.738*	.609	.080			
4:05 a.	24-36	2.38	1.028	.747	*.620*	.090			
3:36 a.	29-56	2.00	1.141	.828	*.665*	.085			
3:28 a.	31-23	1.91	1.151	*.836*	.676	.090			
2:01 a.	45-30	1.39	1.285	.895	*.715*	.095			
1:54 a.	46-28	1.38	1.294	*.907*	.717	.095			
0:40 a.	53-48	1.24	1.329	.926	*.731*	.100			
0:35 a.	54-05	1.24	1.321	*.930*	.731	.110			
0:54 p.	52-56	1.25	1.296	*.870*	*.704*	.100			
0:59 p.	52-35	1.26	1.290	*.867*	.701	.100			

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes-Perkins, and Mount Wilson Observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1932	H m	°	°	°			
Mar. 1 (Naval Observatory)	10 45	−39.0	108.6	+12.0	.....	278	.....
		−18.0	129.6	−5.0	.....	25	.....
		+50.0	197.6	+6.0	.....	185	488
Mar. 2 (Naval Observatory)	13 9	−23.0	110.1	+11.0	.....	278	.....
		−3.0	130.1	−5.0	15	.....	.....
		+65.0	198.1	+6.0	.....	432	725
Mar. 3 (Naval Observatory)	11 0	−10.0	111.1	+11.0	.....	247	.....
		+80.0	201.1	+6.0	.....	309	556
Mar. 4 (Yerkes Observatory)	11 31	−40.9	66.8	+7.5	.....	13	.....
		−4.5	103.2	+10.0	.....	30	.....
		−1.6	106.1	+10.6	5	.....	.....
		0.0	107.7	+10.5	3	.....	.....
		+6.0	113.7	+12.0	.....	280	331
Mar. 5 (Naval Observatory)	10 40	−29.0	66.0	+8.0	31	.....	.....
		+16.0	111.0	+11.0	.....	247	278
Mar. 6 (Yerkes Observatory)	12 36	+23.9	104.7	+9.8	16	.....	.....
		+27.5	108.3	+10.1	.....	23	.....
		+32.0	112.8	+12.0	304	.....	343
Mar. 7 (Naval Observatory)	10 41	+45.0	113.6	+12.0	.....	216	216
Mar. 8 (Naval Observatory)	10 52	+59.0	114.3	+12.0	.....	185	185
Mar. 9 (Naval Observatory)	10 52	+72.0	114.2	+12.0	170	.....	170
Mar. 10 (Naval Observatory)	10 8	No spots			.....	.....	.....
Mar. 11 (Naval Observatory)	10 20	No spots			.....	.....	.....
Mar. 12 (Naval Observatory)	10 44	No spots			.....	.....	.....
Mar. 13 (Naval Observatory)	13 32	No spots			.....	.....	.....
Mar. 14 (Naval Observatory)	10 48	No spots			.....	.....	.....
Mar. 15 (Naval Observatory)	10 25	No spots			.....	.....	.....
Mar. 16 (Naval Observatory)	11 33	No spots			.....	.....	.....
Mar. 17 (Naval Observatory)	11 50	−48.0	248.1	−8.0	.....	93	93
Mar. 18 (Naval Observatory)	11 42	−34.0	249.1	−8.0	.....	62	62
Mar. 19 (Naval Observatory)	10 42	−22.0	248.5	−8.0	.....	46	46
Mar. 20 (Naval Observatory)	12 39	No spots			.....	.....	.....
Mar. 21 (Mount Wilson)	11 50	+16.0	259.5	−7.0	.....	15	15
Mar. 22 (Naval Observatory)	14 41	No spots			.....	.....	.....
Mar. 23 (Naval Observatory)	11 4	No spots			.....	.....	.....
Mar. 24 (Naval Observatory)	11 2	No spots			.....	.....	.....
Mar. 25 (Naval Observatory)	10 44	−79.0	112.3	+14.0	46	.....	46
Mar. 26 (Naval Observatory)	10 10	−64.0	114.4	+14.0	46	.....	46
Mar. 27 (Mount Wilson)	13 40	−50.0	113.3	+12.0	44	.....	.....
		−28.0	135.3	−6.0	.....	6	50
Mar. 28 (Naval Observatory)	14 49	−34.0	115.5	+14.0	46	.....	46
Mar. 29 (Naval Observatory)	10 15	−24.0	114.8	+13.0	46	.....	46
Mar. 30 (Naval Observatory)	12 7	−10.0	114.6	+13.0	46	.....	46
Mar. 31 (Mount Wilson)	9 45	+2.0	114.6	+12.0	66	.....	66
Mean daily area for March							124

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MARCH, 1932

[Dependent alone on observations at Zurich and its station at Arosa]

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

March, 1932	Relative numbers	March, 1932	Relative numbers	March, 1932	Relative numbers
1	34	11	0	21	7
2	46	12	0	22	7
3	37	13	0	23	0
4	a 24	14	0	24	7
5	22	15	0	25	0
6	22	16	0	26	8
7	16	17	.....	27	15
8	.....	18	.....	28	8
9	.....	19	9	29	8
10	8	20	7	30	8
				31	7

Mean: 27 days=11.1.

a=Passage of an average-sized group through the central meridian.

AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. GREGG, in charge]

By L. T. SAMUELS

The free-air temperature for the month averaged decidedly below normal at most stations (Table 1.) The only positive departures occurred in the upper levels at Pensacola. The largest negative departures occurred at the northern stations. Extremely low free-air temperatures were recorded during the month and these exceeded any recorded during the past winter at Chicago and Cleveland from 1 to 4 kilometers, at Dallas from 1 to 2 kilometers, and at Omaha from 2 to 3 kilometers.

Relative humidities averaged mostly above normal, with the largest positive departures at the northern stations.

Free-air resultant wind velocities for the month were considerably above normal between 1 and 4 kilometers. (Table 2.) Resultant wind directions were close to normal at practically all stations.

Airplane observations were made every day during the month at Cleveland, Dallas, and Omaha and on 29 days at Chicago. The highest mean altitude obtained was 5,579 meters above sea-level at Dallas and the highest single flight was also made at this station and reached 6,207 meters above sea level.

TABLE 1.—*Free-air temperatures, and relative humidities, during March, 1932*

TEMPERATURE (° C.)

Altitude (meters) m. s. l.	Chicago, Ill. (190 meters) [1]		Cleveland, Ohio (245 meters) [1]		Dallas, Tex. 149 meters) [2]		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Hampton Roads, Va.[3] (2 meters)		Omaha, Nebr.[4] (299 meters)		Pensacola, Fla.[3] (2 meters)		San Diego, Calif.[3] (9 meters)		Washington, D. C.[3] (2 meters)	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface	−4.1	−7.9	−2.8	−6.6	6.8	−5.1	7.7	−3.0	−7.3	−5.3	5.1	−1.5	−3.0	−6.0	11.1	−0.2	15.3	−0.2	1.7	−4.2
500	−4.7	−6.3	−3.3	−4.9	7.6	−2.7	7.1	−1.9	−7.9	−5.7	3.1	−2.3	−2.9	−5.3	10.0	0.0	12.7	−1.3	0.6	−3.0
1,000	−6.4	−6.0	−5.0	−4.6	7.5	−1.2	5.0	−1.5	−10.6	−7.1	1.0	−2.0	−3.4	−4.3	9.3	+1.2	11.5	−1.3	−1.0	−2.5
1,500	−7.3	−5.4	−7.0	−5.1	6.2	−1.1	3.0	−1.2	−10.6	−6.0			−4.1	−4.4						
2,000	−8.4	−4.8	−7.8	−4.2	4.4	−1.3	0.8	−1.2	−11.8	−5.4	−3.5	−1.9	−4.9	−3.5	7.1	+2.4	7.7	−0.3	−4.4	−1.5
2,500	−10.4	−4.6	−9.2	−3.4	2.1	−1.3	−1.0	−0.8	−13.5	−4.7			−7.0	−3.1						
3,000	−13.0	−4.8	−11.6	−3.4	−0.6	−1.5	−3.5	−1.1	−15.5	−3.9	−7.6	−1.4	−9.8	−3.3	3.3	+2.3	1.7	−0.4	−7.6	−0.7
4,000	−19.1	−5.8	−17.7	−4.4	−7.4	−2.6			−20.3	−3.3			−16.2	−4.4	1.5	+5.4	−5.8	−0.4		
5,000	−28.4	−8.9	−24.3	−4.8	−15.1	−4.5							−23.2	−4.8						

RELATIVE HUMIDITY (PER CENT)

Surface	72	0	83	+11	75	+4	64	0	80	+7	68	+4	78	+10	76	+4	70	+5	67	+2
500	68	−3	81	+10	66	−1	57	−4	80	+8	65	+7	76	+9	68	+4	69	+6	65	+2
1,000	65	−1	80	+14	58	−2	53	−6	79	+15	65	+9	69	+8	61	+4	60	+8	63	+2
1,500	61	+2	78	+19	53	+2	51	−7	69	+11			60	+8						
2,000	53	−2	70	+15	48	+5	44	−10	66	+10	64	+12	57	+7	48	0	40	+3	58	+1
2,500	50	−3	65	+12	46	+7	41	−9	62	+6	62		56	+6						
3,000	47	−6	63	+10	48	+11	38	−6	58	+1	53	+8	57	+6	46	+4	32	+2	49	+1
4,000	44	−6	58	+8	48	+9			73	+20			58	+8	38	−5	32	+2		
5,000	54	0	58	+4	45	+6							57	+7						

[1] Normals for Royal Center, Ind., used.
[2] Normals determined by interpolating between those for Groesbeck, Tex., and Broken Arrow, Okla.
[3] Naval air stations.
[4] Normals for Drexel, Nebr., used.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 7 a. m. (E. S. T.) during March, 1932*

[Wind from N=360°, E=90°, etc.]

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,528 meters)		Bismarck, N. Dak. (518 meters)		Brownsville, Tex. (12 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo. (1,873 meters)		Chicago, Ill. (198 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Due West, S. C. (217 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	33	0.3	318	1.6	252	0.6	286	2.3	289	5.9	293	1.4	273	2.8	307	0.8	265	2.3	250	1.6	283	1.6	9	0.7
500					145	2.0	284	4.7			296	4.2	275	5.1	263	2.2	272	5.5			285	4.3	214	0.5
1,000			319	6.0	224	1.0	304	7.2			290	5.6	278	7.9	272	5.1	276	6.8	268	3.2	269	6.5	221	3.6
1,500			312	7.6	282	2.9	303	9.8			299	11.4	282	8.9	298	6.6	280	8.7	301	6.7	270	8.2	223	4.2
2,000	294	3.9	311	10.0	264	4.4	308	11.0	288	8.8	298	12.0	288	10.8	308	7.8	282	12.4	305	7.9	285	12.1	225	5.0
2,500	299	8.1	319	10.6	276	5.7	304	12.2	291	13.2	289	15.4	294	12.6	302	8.5	281	12.6	291	9.2	280	14.6	238	4.9
3,000	306	10.4	315	12.2	295	8.5	294	12.5	295	13.4	291	16.0			287	10.9	277	13.1	298	9.0	271	14.5	239	3.7
4,000	293	13.6							294	12.9					284	14.2	279	17.0					291	8.7
5,000	276	13.6							275	12.5							259	22.4						

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 7 a. m. (E. S. T.) during March, 1932*—Continued

Altitude (meters) m. s. l.	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (85 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (392 meters)		Omaha, Nebr. (299 meters)		Phoenix, Ariz. (356 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	321	1.8	226	0.5	331	0.7	10	0.6	76	0.8	344	1.0	351	2.3	102	1.7	100	0.6	17	0.7	182	2.3	283	2.6
500	7	1.5	211	0.3	257	4.0	269	1.8	340	2.0	272	0.9	323	3.3	108	0.7	------	------	356	1.0	193	5.6	291	8.3
1,000	1	2.8	151	1.1	272	6.9	252	3.4	354	4.2	285	4.6	296	8.0	317	1.5	------	------	298	2.8	207	5.9	285	12.3
1,500	358	3.3	229	2.8	282	9.6	270	6.9	329	4.2	284	5.4	299	11.1	333	3.2	204	0.8	305	5.4	191	4.9	302	15.7
2,000	356	4.6	275	4.5	289	10.2	293	10.1	331	5.4	287	7.2	298	13.0	311	4.0	277	3.2	308	8.0	217	3.5	291	14.9
2,500	341	4.7	287	7.2	305	11.9	282	13.0	328	6.3	294	9.4	300	13.5	312	5.1	290	4.3	320	9.0	250	4.1	255	8.4
3,000	329	4.5	296	9.2	------	------	278	13.4	320	7.9	286	12.1	307	17.1	304	4.3	297	6.5	320	9.8	253	4.9	286	19.3
4,000	298	5.8	299	10.2	------	------	280	19.9	310	8.5	------	------	------	------	303	9.3	306	9.2	------	------	------	------	------	------
5,000	------	------	------	------	------	------	------	------	------	------	------	------	------	------	299	9.5	------	------	------	------	------	------	------	------

WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By M. C. BENNETT

GENERAL SUMMARY

The monthly mean temperature for March was decidedly below the normal in all sections from the Rocky Mountains eastward. A number of Southern States reported the lowest March temperatures of record during the first half of the month. Freezing weather extended southward to the extreme lower Rio Grande Valley. In the interior valleys the average temperatures for the month were from 5° to 9° below the normal. On the other hand, the average for the month in the Pacific coast area was slightly above the seasonal average.

The precipitation for the month was very irregularly distributed. In most of the Atlantic area, much of Florida, the lower Mississippi and the upper Ohio Valleys, the monthly totals were above normal. In the western Ohio, central Mississippi and lower Missouri Valleys, and portions of Texas and Oklahoma they were below the normal, while the Pacific Northwest had more than normal, but the far Southwest was generally dry, while the southern portions of Arizona and California received no precipitation throughout the month. Snowfall was heavy in portions of the Northeast and much of the Lake Region, with as much as an inch occurring as far south as Palestine, Tex., and measurable amounts to Corpus Christi, Tex., and Montgomery, Ala.

For the first time in more than a year an important group of destructive local storms was reported. (See article on p. 89 of this REVIEW.)

TEMPERATURE

March was in marked contrast with the winter months which had just preceded, being colder than normal in all sections save the far West. In much of the Lake, central valley, middle Appalachian, and southeastern regions it was the coldest month of the whole cold season.

The first few days were cold in most of the far West, but quite mild nearly everywhere from the Plains eastward. By the 4th decidedly cold weather had set in over the northern and central Plains. It extended southward and more gradually eastward, the Northeastern States coming under its sway on the 7th or 8th. Generally, the period from the 6th to the 15th was the coldest or almost the coldest 10-day period ever recorded in March in the central and southeastern portions of the country. At Huron, S. Dak., this period averaged 15° colder than normal; at San Antonio, Tex., 20° colder; at Cairo, Ill., 19° colder; and at Savannah, Ga., 15° colder. In the far Northwest this same period was mainly cold till the 13th, except close to the coast, but from the 13th onward was about normal in both coast and interior sections, while in the far Southwest temperatures were mainly above normal, particularly in California.

The second half of the month saw moderate variations of temperature in most sections, but was largely warmer than normal from the Pacific to the Plains, especially in California and Montana. In the eastern half of the country a few districts in the lower Mississippi Valley and the South Atlantic States averaged slightly warmer than normal, but mainly this period was colder than normal, particularly in the Lake region, the upper Mississippi and upper Ohio Valleys, and the interior portions of New York and New England.

March averaged somewhat warmer than normal in California, most of Nevada and western Arizona, and between the Cascade Mountains and the Pacific coast. In practically all other regions it was colder than normal and save in the Plateau region, some Atlantic States, and part of the Missouri Valley, at least 4° colder. From South Dakota, Nebraska, and Kansas eastward to Lake Michigan and the upper Ohio Valley the deficiency was usually 6° to 8° per day. In parts of the upper Mississippi Valley very few Marches have averaged colder than this one.

The highest temperature reported was 102° at two Texas stations on the 20th. In numerous States the highest marks were in the eighties, but from North Dakota to New York and New England they were generally in the sixties. Several Southeastern States noted their highest readings during the first three days, but the southern half of the country otherwise about the 20th, and the northern half largely during the final three days.

Save in the Northeast and North Dakota the lowest marks were recorded during the first 12 days. In most of the Southeast they were between zero and 25°, and came usually on the 10th, when numerous stations approached the lowest March temperatures of record. Apart from the Southeast nearly every State recorded a zero temperature, the very lowest reported being −43° at Riverside, in Yellowstone National Park, on the 11th.

PRECIPITATION

The precipitation during March was mainly well distributed in point of time. The interior of the south-central portion, however, received but little between the 6th and 20th, and in fact much of the lower Mississippi Valley got a great part of the monthly total during the last few days of the month.

As a whole, March gave much more than normal precipitation to the far Northwest, also to almost all districts from Kentucky and North Carolina northeastward. Amounts moderately above normal usually were received in central and northeastern Florida, the central part of the lower Mississippi Valley, northern Iowa and districts adjacent, and considerable portions of Wyoming and Colorado.

Nearly all of California and Arizona received far less precipitation than normal, while the middle Plateau States and western New Mexico had somewhat less. Most Gulf coast districts from western Florida westward fell far short of the normal amounts, as did almost all of the southern Plains and the central valley areas. From Michigan to central Montana there was generally a shortage, also in Nebraska and western South Dakota.

The greatest amount reported at a single station was 29.63 inches, at a place in western Washington. East of the Continental Divide the maximum was 9.79 inches at a station in the West Virginia mountains.

SNOWFALL

As a rule snowfall was greater than normal, often much greater, in the northern and middle Rocky Mountain and Plains States, the upper Mississippi Valley, Lake region, and to eastward. Several States in the Lake region measured the largest snowfall ever known in March or very nearly the largest.

At Norfolk, Va., snow fell for the first time since March, 1931; and at Parkersburg, W. Va., the first measurable snow for over 11 months came on the 6th. There was snow enough to measure at some Texas coast stations for the first time ever known at those places in March.

The central valleys and the Ozark region usually had little snow, and there was mainly but little in the middle and southern Plateau areas.

The outlook for abundant stream flow in the Western States was usually quite good at the end of March, but in some of the southern mountain districts there was only about an average amount of stored snow or slightly less than average.

SUNSHINE AND RELATIVE HUMIDITY

Much cloudy weather prevailed in the region of the Great Lakes, the Ohio Valley and the northern half of the area west of the Rocky Mountains, while more than the usual amount of sunshine was received in the southern portion of the Plateau and Pacific areas. Elsewhere about the normal amount for March prevailed. The relative humidity was generally above the normal in much of the northern border States and also in the central portion of the Great Plains and Plateau regions, while elsewhere it was generally below the seasonal average. The departures above and below the normal were as a rule small; however, in the central portion of the South Atlantic States the deficiencies were more pronounced.

SEVERE LOCAL STORMS, MARCH, 1932

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)[1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Illinois and Indiana	1-2				$388,000	Glaze	Telephone and electric wires and poles broken; orchard and shade trees damaged; wire communication cut off in many places.	Official, U. S. Weather Bureau.
Iowa (northern half)	1-2					Glaze and wind	Many thousands of dollars damage to telephone, telegraph, and radio equipment; power and electric service crippled.	Do.
Lyon, Sioux, Clay, Dallas, Polk, Marshall, Boone, Webster, Woodbury, and Plymouth Counties, Iowa.	1-4					Floods	Bridges and roadbeds washed out; railways inundated; farm lands flooded.	Do.
Deepwater and Lynchburg, Tex.	3	4:15 a. m.	300			Tornado	Several houses and garages wrecked; 12 persons injured.	Do.
Atlantic seaboard (Florida to Sandy Hook).	5-6					Wind	Much damage to crops, timber, marine interests, overhead wires, and buildings.	Do.
Northern Virginia, western Maryland, and West Virginia.	6-7			2	1,642,800	Wind, rain, sleet, and snow.	Wire systems and buildings damaged; motor traffic tied up.	Do.
New York and northern Pennsylvania.	6-7			3		Snow and wind	Widespread damage to telephone and telegraph equipment; roads blocked; wire service entirely suspended in some places.	Do.
Salem (near), Ark	16	8:30 p. m.			1,500	Tornado	Timber, barns and contents damaged	Do.
Little Rock to Scott, Ark	16	9:15 p. m.	100		57,000	do	Damage chiefly to communication lines and buildings; path 1.5 miles long; 5 persons injured.	Do.
Crawford County, Ark	16-17				2,000	Wind	Buildings damaged	Do.
Paris, Ark	16-17				7,500	do	Chief damage to buildings	Do.
St. Joe, Ark	16-17					do	Frame buildings and roofs damaged	Do.
Walla Walla, Wash	18				25,000	Heavy rains	Roads and bridges damaged; gardens and farm lands flooded.	Do.
New Mexico	20	10 a. m. -5 p. m.			10,000	Wind	Autos, roofs, sheds, trees and fields damaged	Do.
El Paso, Tex	20	P m				do	Considerable damage to roofs, signs, plate glass windows, and insecure objects; alfalfa injured.	Do.
Arizona	20-21			1		do	Small house unroofed; 1 person injured	Do.
Carrier Mills to near Harrisburg, Ill.	21	3 p. m.	8-16		10,000	Tornado	Buildings damaged; path 6 miles long	Do.
Uniontown, Ky., to Seymour, Ind.	21	3: 35-6 p. m.		2	247,000	Wind and hail	Heavy property and crop damage	Do.
Lewis to Trusdale County, Tenn.	21	5 p. m.	250-440	3	60,000	Tornado	Character of damage not reported. 16 persons injured; path 90 miles long.	Do.
Lawrence to De Kalb County, Tenn.	21	5: 30-7 p. m.	100-440	9	120,000	do	Great destruction to property along 100-mile path; 73 persons homeless.	Do.
Atlanta, Ga., and vicinity	21	6-7 p. m.		1	15,000	Wind	Plate-glass windows broken; power lines damaged; light and telephone service impaired.	Do.

[1] "Mi." indicates miles instead of yards.

Severe local storms, March, 1932—Continued

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Evansville, Ind	21	6:15 p. m.			$200,000	Tornado	Many buildings damaged; fences and insecure signs blown down.	Official, U. S. Weather Bureau.
Georgia (northern)	21	7:15-8 p. m.		28	174,000	7 tornadoes	More than 200 homes wrecked; several hundred persons injured; livestock killed; telegraph and telephone companies suffer heavy loss.	Do.
Polk County, Tenn	21	7:22 p. m.	440-1,760	7	60,000	Tornado (entered from Georgia).	17 persons injured; character of damage not reported.	Do.
Charleston, Tenn	21	8:50 p. m.	100	1	60,000	Tornado	21 buildings demolished or damaged; 23 persons injured.	Do.
Jefferson and Cocke Counties, Tenn.	21	10 p. m.	1.5 mi.		60,000	Wind	Heavy property damage; 20 head of cattle killed; 6 persons injured.	Do.
Alabama (northern)	21	P. m.		264	3-4,000,000	7 tornadoes	Extensive property damage; many families left homeless; hundreds injured; livestock killed.	Montgomery Advertiser (Ala.).
Strong, Rosebloom, and Goodman, Miss.	21					3 tornadoes	No details reported	Official, U. S. Weather Bureau.
Marion County, Tenn	21			2	15,000	Tornado (entered from Alabama)	12 houses destroyed	Do.
Pine Bluff, Ark	21				1,000	Wind	Buildings and homes damaged; trees uprooted	Do.
Northern Illinois, Indiana, and Ohio.	21-22				683,150	Snow, wind, glaze, and possibly 2 tornadoes.	Public utilities suffer delay and losses. Winds of tornadic character at Hamilton and Radnor, Ohio.	Do.
Clarke to Madison County, Ga.	22	1:45 a. m.	50-300	12	60,000	Tornado	75 houses and several old churches wrecked; roofs and small buildings damaged; wires down.	Do.
Greenville, Laurens, Spartanburg, and Cherokee Counties, S. C.	22	A. m.			10,000	Wind squalls	Character of damage not reported	Do.
Jonesville, S. C	22	A. m.			15,000	Severe thunderstorm.	Cotton warehouse damaged by lightning	Do.
Spartanburg County, S. C.	22	A. m.	350-400	3	100,000	Tornado	100 persons homeless; 34 persons injured. Character of damage not reported.	Do.
Parkersburg, W. Va	22				4,000	Wind	Roofs and small buildings damaged	Do.
Garfield and adjacent counties, Wash.	24	12:30 p. m.			6,000	Gale	Power line blown down; roofs damaged; crops hurt.	Do.
Selman City, Tex	27	5 a. m.	100		75,000	Tornado	Oil derricks down; several farm homes demolished; 20 persons injured; path 3 miles long.	Do.
Pattison, Miss., and vicinity.	27	9:40 a. m.	25			Probably tornado.	No details of damage; path 2.5 miles long	Do.
Box Elder (near), Tex	27	A. m.		1		Tornado	Farms damaged; communication lines blown down; 13 persons injured.	Do.
Buchanan, Ga. (5 miles east).	27	6 p. m.		1	25,000	do	26 houses wrecked, 13 damaged	Do
Corinth to Newnan, Ga	27	6:15-6.30 p. m.			35,000	do	18 houses demolished; many persons hurt	Do.
Atlanta, Ga	27	6:30 p. m.			1,000	Wind	Chimneys blown down; trees prostrated; transmission lines out of commission.	Do.
Albany, Ga	27				2,000	do	Garages blown down; several homes unroofed; trees uprooted.	Do.
Bibb and Chilton Counties, Ala.	27			6		Tornado	Details not reported	Montgomery Advertiser, (Ala.)
Elmore to Chambers Counties, Ala.	27					do	Homes and stores wrecked; 12 persons injured	Do.
Western Maryland	27-28				500,000	Wind and snow	Chief damage to poles and overhead wires	Official, U. S. Weather Bureau.
Amelia, Powhatan, Goochland, Hanover, Essex, and Caroline Counties, Va.	28				95,000	Severe squalls and small tornado.	Homes, barns, and mills affected. Tornado characteristics at Loretto.	Do.
Anne Arundel, Queen Annes and Kent Counties, Md.	28				13,000	Wind	Chief loses to telegraph companies; dwellings and barns damaged.	Do.
Scott City, Kans. (3 miles north).	29	5 p. m.				Tornado	No damage reported; occurred over sparsely settled area.	Do.
Coffee County, Ala.	31					do	No details reported	Do.
Howard, Kans. (8 miles north).	31	10 a. m.				do	do	Do.

THE TORNADOES OF THE LATTER PART OF MARCH, 1932

By H. C. HUNTER

[Weather Bureau, Washington, May 2, 1932]

During the final fortnight of March, 1932, tornadoes were much more numerous and destructive than they had been at any time previously since 1927. The region of occurrence was wholly within the southeastern quarter of the country.

Practically all of the tornadoes occurred within two periods of time, which were not quite a week apart. By far the more important group came during the latter part of Monday, the 21st, and the very first few hours of the 22d. The other period marked by several tornadoes embraced the 27th and the first hours of the 28th. The group of the 21st–22d was apparently the most destructive tornado group experienced in the section to southward of the Ohio River since February 19, 1884. In fact, the State of Alabama, which suffered most severely, has probably never known another visitation ranking with this one in 1932.[1]

The regular observations of the Weather Bureau, taken at each hour of 7, ninetieth meridian time, locate the center of the large low-pressure area connected with the first group of tornadoes as follows: Forenoon of 21st, near Fort Smith, Ark.; evening of 21st, Louisville, Ky.; forenoon of 22d, Buffalo, N. Y. The area connected with the second group was located as follows: Evening of 26th, near Abilene, Tex.; forenoon of 27th, Vicksburg, Miss.; evening of 27th, Knoxville, Tenn.; forenoon of 28th, Philadelphia, Pa.

Table 1 summarizes the information so far obtained, arranged by the individual States. The total number of tornadoes in the first group is thought to be three less than the sum of the State numbers, since two of the Tennessee tornadoes apparently entered from other

[1] Cf. Stevens, W. R., Tornadoes in Alabama. MO. WEATHER REV., 53: 437–443.

States, one from Alabama and one from Georgia, while the Kentucky and Indiana storms seem to have been the same storm.

TABLE 1.—*Preliminary synopsis of tornadoes during latter part of March, 1932*

[Times herein all 90th meridian]

GROUP OF MARCH 21 AND 22

State	Day and hour	Number	Loss of life
Mississippi	21st	3	0
Alabama	21st, p. m.	7	264
Georgia	21st, 7.15 p. m., to 22d, 12.45 a. m.	8	40
South Carolina	22d, very early	1	3
Tennessee	21st, 5 to 10 p. m.	5	22
Kentucky	21st, p. m.	1	2
Indiana	21st, 6.15 to 7 p. m.	1	0
Illinois	21st, 3 p. m.	1	0

GROUP OF MARCH 27 AND 28

Texas	27th, 5 a. m.	2	1
Mississippi	27th, 9.40 a. m.	1	0
Alabama	27th	2	7
Georgia	27th, 6 to 6.30 p. m.	2	1
Virginia	28th, 1 a. m.	1	0

RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, Montrose W. Hayes in charge]

Floods in North Carolina and Oregon were the only important ones in March, except those that continued from preceding months. Minor freshets occurred in Virginia, South Carolina, Alabama, the Ohio basin, Illinois, Iowa, and Texas. In the Yellowstone River there was some local flooding caused by ice gorges. A gorge above Miles City was successfully dynamited before it had impounded enough water to cause any damage of consequence.

Estimates of losses caused by floods, collected from all available sources considered reliable, have been segregated and are given in the following table.

ATLANTIC SLOPE DRAINAGE

Tangible property totally or partially destroyed:
- Roanoke River (N. C.) $1,000
- Neuse River (N. C.) 500
- Cape Fear River (N. C.) 1,000

Total 2,500

Suspension of business, including wages of employees:
- Roanoke River (N. C.) 1,000
- Neuse River (N. C.) 500
- Cape Fear River (N. C.) 500
- Peedee River (S. C.) 6,265

Total 8,265

MISSISSIPPI SYSTEM

Upper Mississippi Basin

Tangible property totally or partially destroyed:
- Raccoon River (Iowa) 2,000
- Des Moines River (Iowa) 5,800

Total 7,800

Missouri Basin

Tangible property totally or partially destroyed:
- Yellowstone River (Mont.) 1,000
- Missouri River (S. Dak.-Nebr.) 5,100

Total 6,100

Matured crops: Missouri River 2,000

Arkansas Basin

Tangible property totally or partially destroyed: Arkansas River (Ark.) $2,000
Prospective crops: Petit Jean River (Ark.) 3,000

PACIFIC SLOPE DRAINAGE

Columbia Basin

Tangible property, totally or partially destroyed: Willamette River (Oreg.) 69,000
Prospective crops: Willamette River 10,090
Livestock and other movable property: Willamette River 800
Suspension of business, including wages of employees: Willamette River 53,300

The following is a statement of the estimated value of property saved by warnings.

ATLANTIC SLOPE DRAINAGE

- Roanoke River $12,000
- Neuse River 2,000
- Cape Fear River 3,500
- Peedee River 10,750
- Santee River 3,900
- Savannah River 500

Total 32,650

MISSISSIPPI SYSTEM

Missouri Basin

Missouri River 5,000

Ohio Basin

Green River 100

Arkansas Basin

Arkansas River 3,500

PACIFIC SLOPE DRAINAGE

Columbia Basin

Willamette River 119,000

A report of losses caused by floods which prevailed in the Tallahatchie, Yazoo, lower Mississippi, and Atchafalaya Rivers during the greater part of January, February, and March will appear in a later issue of the REVIEW.

A tabular statement of flood stages that occurred during March is given below.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE	Feet			Feet	
St. Joseph: Montpelier, Ohio	10	Mar. 27	Mar. 28	10.3	Mar. 28.
ATLANTIC SLOPE DRAINAGE					
James:					
Columbia, Va.	10	Mar. 7	Mar. 9	21.0	Mar. 7.
		Mar. 20	Mar. 20	11.1	Mar. 20.
		Mar. 23	Mar. 23	10.7	Mar. 23.
		Mar. 28	(1)	16.6	Mar. 30.
Richmond, Va.	8	Mar. 8	Mar. 8	9.6	Mar. 8.
Dan:					
Danville, Va.	8	Mar. 7	Mar. 7	8.2	Mar. 7.
Clarksville, Va.	12	Mar. 8	Mar. 8	12.4	Mar. 8.
Roanoke:					
Randolph, Va.	21	Mar. 7	...do....	24.2	Do.
Weldon, N. C.	31	...do....	Mar. 11	40.3	Mar. 9.
Scotland Neck, N. C.	23	Mar. 8	...do....	29.9	Mar. 10.
Williamston, N. C.	9	Mar. 9	Mar. 20	12.7	Mar. 14.
Fishing Creek: Enfield, N. C.	14	...do....	Mar. 9	14.6	Mar. 9.
Tar:					
Rocky Mount, N. C.	9	Mar. 10	Mar. 11	9.5	Mar. 11.
Tarboro, N. C.	18	Mar. 12	Mar. 13	18.9	Mar. 12.
Greenville, N. C.	14	Mar. 13	Mar. 14	14.7	Mar. 14.
Neuse:					
Neuse, N. C.	15	Mar. 7	Mar. 11	17.9	Mar. 9.
Smithfield, N. C.	14	...do....	Mar. 12	18.4	Do.

[1] Continued into April.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE—contd.					
Cape Fear:	*Feet*			*Feet*	
Moncure, N. C.	22	Mar. 7	Mar. 7	25.7	Mar. 7.
Fayetteville, N. C.	35	Mar. 8	Mar. 9	42.7	Mar. 8.
Elizabethtown, N. C.	22	...do...	Mar. 12	30.4	Mar. 10.
Peedee:					
Cheraw, S. C.	27	Mar. 7	Mar. 9	33.3	Mar. 8.
Mars Bluff Bridge, S. C.	17	Mar. 9	Mar. 16	20.1	Mar. 12.
Poston, S. C.	18	Mar. 13	Mar. 18	19.7	Mar. 15.
Saluda: Pelzer, S. C.	7	Mar. 22	Mar. 23	7.8	Mar. 23.
Broad: Blairs, S. C.	15	Mar. 6	Mar. 7	18.3	Mar. 7.
Wateree: Camden, S. C.	24	Mar. 7	Mar. 8	24.7	Mar. 8.
Santee:					
Rimini, S. C.	12	Mar. 8	Mar. 18	14.7	Mar. 11.
		Mar. 25	Mar. 28	12.4	Mar. 27.
Ferguson, S. C.	12	Mar. 7	Mar. 21	13.6	Mar. 12.
		Mar. 25	Mar. 28	12.2	Mar. 28.
Savannah: Ellenton, S. C.	14	Feb. 15	Mar. 1	20.0	Feb. 25.
		Mar. 7	Mar. 12	18.2	Mar. 10.
		Mar. 24	Mar. 29	17.3	Mar. 26.
Ogeechee:					
Dover, Ga.	7	Mar. 2	Mar. 3	7.2	Mar. 2.
		Mar. 11	Mar. 13	7.1	Mar. 12.
		Mar. 15	Mar. 17	7.2	Mar. 16.
Meldrim, Ga.	9	Mar. 21	Mar. 21	9.0	Mar. 21.
EAST GULF OF MEXICO DRAINAGE					
Cahaba: Centerville, Ala.	23	Mar. 31	Apr. 1	30.0	Mar. 31.
Pearl: Jackson, Miss.	22	Feb. 22	Mar. 8	29.1	Feb. 28, 29.
West Pearl: Pearl River, La.	13	Feb. 25	Mar. 17	15.2	Feb. 26-29.
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline Bridge, Ill.	10	Mar. 30	Apr. 2	10.2	Apr. 1.
Raccoon: Van Meter, Iowa	13	Mar. 2	Mar. 5	14.2	Mar. 4.
Des Moines:					
Tracy, Iowa	14	Mar. 5	Mar. 9	15.4	Mar. 7.
Ottumwa, Iowa	10	Mar. 6	...do...	11.5	Do.
Illinois: Peru, Ill.	14	Mar. 5	Mar. 7	14.8	Mar. 5.
		Mar. 9	Mar. 12	14.1	Mar. 11.
		Mar. 27	Apr. 9	16.0	Mar. 30.
Missouri Basin					
Big Sioux: Akron, Iowa	12	Mar. 28	Mar. 30	14.9	Mar. 29.
Missouri: Yankton, S. Dak.	12	Mar. 18	Mar. 25	14.8	Mar. 22.
Ohio Basin					
Monongahela: Lock 15, Hoult, W. Va.	22	Mar. 28	Mar. 29	22.0	Mar. 28, 29.
Little Kanawha:					
Glenville, W. Va.	23	Mar. 17	Mar. 18	25.0	Mar. 17.
		Mar. 28	Mar. 29	24.0	Mar. 28.
Creston, W. Va.	20	Mar. 18	Mar. 18	20.7	Mar. 18.
		Mar. 28	Mar. 29	21.3	Mar. 28.
Elk: Clay, W. Va.	18	Mar. 18	Mar. 18	18.2	Mar. 18.
Green:					
Munfordville, Ky.	28	Mar. 29	Mar. 31	29.0	Mar. 30.
Lock 6, Brownsville, Ky.	28	Mar. 30	Apr. 1	29.6	Mar. 31.
Lock 4, Woodbury, Ky.	33	Mar. 29	Apr. 3	37.1	Apr. 1.
Lock 2, Rumsey, Ky.	34	Mar. 31	Apr. 8	37.2	Apr. 5.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Arkansas Basin					
Petit Jean: Danville, Ark.	*Feet* 20	Mar. 29	Mar. 30	*Feet* 21.7	Mar. 30.
Arkansas: Yancopin, Ark.	29	Jan. 8	Mar. 11	40.2	Feb. 24, 25.
Red Basin					
Sulphur: Ringo Crossing, Tex.	20	Mar. 6	Mar. 6	20.4	Mar. 6.
Lake Bisteneau: Minock, La.	28	Feb. 20	Mar. 10	32.4	Feb. 26, 27.
Lower Mississippi Basin					
Tallahatchie: Swan Lake, Miss.	24	Dec. 15	Mar. 29	35.0	Jan. 15.
Yazoo:					
Greenwood, Miss.	35	Dec. 23	Mar. 17	40.1	Jan. 19, 20.
Yazoo City, Miss.	23	Dec. 31	(1)	32.0	Feb. 21.
Ouachita: Monroe, La.	40	Dec. 25	(1)	48.9	Feb. 26-28.
Black: Jonesville, La.	50	Jan. 13	(1)	55.6	Mar. 5-8.
Mississippi:					
Helena, Ark.	44	Jan. 31	Mar. 3	49.2	Feb. 22.
Arkansas City, Ark.	48	Jan. 28	Mar. 6	53.4	Feb. 25, 26.
Greenville, Miss.	42	Jan. 30	...do...	47.0	Feb. 26, 27.
Vicksburg, Miss.	45	Jan. 28	Mar. 13	51.9	Feb. 28, 29.
Natchez, Miss.	46	Feb. 1	Mar. 16	52.6	Mar. 1, 2, 4.
Angola, La.	45	...do...	Mar. 20	52.3	Mar. 6.
Baton Rouge, La.	35	...do...	Mar. 21	42.8	Mar. 5, 6.
Plaquemine, La.	31	...do...	...do...	38.3	Mar. 6.
Donaldsonville, La.	28	Feb. 4	Mar. 20	33.5	Mar. 5, 6.
Reserve, La.	22	Feb. 5	Mar. 16	25.2	Mar. 5-8.
New Orleans, La.	17	Feb. 10	Mar. 17	19.2	Mar. 5.
Atchafalaya Basin					
Atchafalaya:					
Simmesport, La.	41	Feb. 3	Mar. 21	47.7	Mar. 7.
Melville, La.	37	Jan. 30	Mar. 23	42.8	Mar. 5-7.
Atchafalaya, La.	22	Dec. 27	(1)	24.9	Mar. 3-5.
WEST GULF OF MEXICO DRAINAGE					
Trinity:					
Dallas, Tex.	28	Feb. 16	Mar. 1	36.8	Feb. 18.
		Mar. 6	Mar. 6	28.7	Mar. 6.
Trinidad, Tex.	28	Feb. 19	Mar. 11	40.0	Feb. 24.
Liberty, Tex.	25	Jan. 9	Mar. 23	27.8	Feb. 28, 29.
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Middle Fork: Eula, Oreg.	13	Mar. 19	Mar. 19	14.7	Mar. 19.
Coast Fork: Saginaw, Oreg.	9	Mar. 18	...do...	11.1	Do.
Long Tom: Monroe, Oreg.	10	Mar. 19	Mar. 27	12.1	Mar. 21.
Santiam: Jefferson, Oreg.	10	Mar. 17	Mar. 20	15.5	Mar. 19.
Willamette:					
Eugene, Oreg.	12	Mar. 18	...do...	15.5	Do.
Harrisburg, Oreg.	10	...do...	Mar. 21	16.0	Do.
Albany, Oreg.	20	Mar. 20	Mar. 22	25.5	Mar. 22.
Salem, Oreg.	20	...do...	...do...	20.8	Mar. 21.
Oregon City, Oreg.	12	...do...	Mar. 23	13.2	Mar. 22.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, W. F. McDONALD in Charge]

NORTH ATLANTIC OCEAN

By F. A. YOUNG

The pressure situation.—The anticyclonic conditions that prevailed off the coast of and over Europe during the greater part of February, extended into the current month until the 3d, when there was a marked fall in pressure, the barometer at Lerwick reading 28.96 inches on the 6th, which was the lowest recorded at that station during the month. Moderate anticyclonic conditions prevailed in the northeastern section of the ocean during the greater part of the time from the 9th to the 24th. As shown in Table 1, positive departures were recorded at both Reykjavik and Lerwick. By the 26th, however, there was an intrusion of low pressure, that continued until near the end of the month.

The North Atlantic HIGH varied considerably from day to day. It was weakest during the first part of the second decade, and strongest near the end of the month.

There was a marked difference in the pressure distribution between the eastern and western sections of the ocean. As shown in Table 1, practically all the stations on the American coast had negative departures. These were due largely to the very severe storm accompanied by extremely low pressure in the first part of the month, and a second disturbance of lesser intensity during the last decade, both of which will be referred to later.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, March, 1932.*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland [1]	29.83	(2)	30.48	[3] 1	29.20	26
Reyjavik, Iceland [1]	29.85	+0.17	30.27	1	29.04	4
Lerwick, Shetland Islands [1]	29.88	+0.18	30.46	1	28.97	6
Valencia, Ireland [1]	29.90	0.00	30.32	22	29.10	30
Lisbon, Portugal [1]	29.95	−0.05	30.39	29	29.55	1
Madeira [1]	29.91	−0.10	30.28	29	29.41	12
Horta, Azores [1]	29.96	−0.22	30.40	28	29.34	[3] 12
Belle Isle, Newfoundland [1]	29.48	−0.32	30.24	3	28.66	16
Halifax, Nova Scotia [1]	29.57	−0.39	30.36	24	28.68	8
Nantucket [4]	29.70	−0.28	30.31	24	28.36	7
Hatteras [4]	29.91	−0.13	30.35	30	28.64	6
Bermuda [1]	29.89	−0.25	30.22	[3] 27	29.16	2
Turks Island [1]	30.01	−0.01	30.14	31	29.82	6
Key West [4]	29.98	−0.07	30.22	29	29.48	6
New Orleans [4]	30.02	−0.02	30.45	10	29.50	5
Cape Gracias, Nicaragua [1]	29.91	−0.07	30.00	[3] 15	29.76	[3] 5

[1] All data based on a. m. observations only, with departures compiled from best available normals related to time of observations.
[2] No normal available.
[3] And on other date or dates.
[4] Corrected 24-hour means, based on more than 1 observation.

Cyclones and gales.—The fact that there was a great difference in the pressure distribution between the eastern and western sections of the ocean is shown by the difference of the number of gales reported by vessels in the two sections. East of the thirty-fifth meridian gales were not reported on more than 2 days in any one 5° square, the greater part of them occurring in the last decade of the month, while in the western section the number was fully equal to or above the normal shown on the Pilot Chart.

From the 1st to 4th there was considerable cyclonic activity along the American coast and a number of vessels in the vicinity reported gales of force 8 to 10, accompanied by lowest barometric readings from 28.84 to 29.68 inches.

From the 5th to 8th there occurred one of the severest storms in many years. On the first date it was central near Port Eads, La., the barometer at New Orleans read 29.58 inches, and one vessel near the center reported lowest reading 29.01 inches, highest force of wind S., 10. Charts VIII to XI cover this period, and give a good idea of the track and intensity of the disturbance that was encountered by a number of vessels as shown in table of gales and storms.

On the morning of the 6th the LOW was central near Raleigh, N. C., where a barometer reading of 28.64 inches was recorded. At 2 p. m. on that date the storm center was over Cape Henry, Va., where the barometer read 28.32 inches, and additional warnings of hurricane winds were broadcast for the middle Atlantic and southern New England coasts. As shown in Table 1, Hatteras reported the lowest barometer reading for the month as 28.64 inches on the 6th; Nantucket, 28.36 inches on the 7th, and Halifax, N. S., 28.68 inches on the 8th. New York and Norfolk experienced their lowest readings of 28.51 and 28.35 inches, respectively, on the 6th, while the lowest vessel reading was 28.35 inches from the *Monarch of Bermuda*, as shown in table of gales. At 8 p. m., on the 6th, the storm was over Atlantic City, barometer 28.32 inches. Thence it pursued a northeastward course, accompanied by winds of hurricane force, together with rain and snow, as well as thunderstorms. On the 6th there was also a severe storm off the north coast of Scotland, as shown by report of Danish S. S. *Tennessee* in table.

On the morning of the 7th, Nantucket, with a barometric reading of 28.44 inches, was near the center of the first disturbance, and at the same time the HIGH over the Canadian northwest had increased to 31 inches. This abnormally steep gradient was accompanied by unusually cold weather over a large area, with gales prevailing from the Great Lakes to Virginia.

During the next 24 hours the storm moved northeastward to Nova Scotia, decreasing but little in intensity, while the northwestern HIGH remained above 31 inches. Over the eastern United States high winds prevailed for nearly a week, the LOW remaining nearly stationary after reaching Newfoundland and gradually filling in. This storm caused a great deal of damage both on land and at sea. Extracts from news reports at the end of this article will give some idea of the losses sustained by vessels.

On the 10th and 11th moderate to strong gales were encountered between the Bermudas and American coast, and on the former date in the vicinity of the Azores, while on the 11th a moderate "norther" occurred in the western part of the Gulf of Mexico.

An examination of the table of storms will show that from the 11th until the end of the month there were a number of disturbances, with highest force of wind in some cases as great as 12. Most of these were over the middle and western sections of the ocean, although from the 24th to 30th there was a well developed LOW over the eastern section of the northern steamer lanes, accompanied by winds of force 9 to 12.

On the 28th and 29th a disturbance was over the region between the Bermudas and the American coast with winds of moderate to strong gale force reported from land stations and vessels.

Extracts from news reports

Florida Times Union, April 29, 1932.—Weeks overdue the four-masted schooner *Charles D. Stanford* was given up for lost. The schooner left Venezuela on January 15, and put into Mayport the middle of February. She was last sighted off Cape Hatteras 12 days after leaving Mayport, and has not been heard from since (undoubtedly caught in the storm of March 5 to 8).

New York Maritime Register.—H. F. De Bardeleben (S. S.) was in latitude 39 39 N., longitude 61 50 W., on the morning of March 9, about 280 miles due east of Nantucket. At 9 a. m. March 9 the *Adriatic* (Br.), Freeman, bound to New York remained standing by to render assistance when feasible. The cutter *Beacon* was unable to overtake the vessel and the cutter *Ossipee* was 70 miles away encountering heavy weather. The crew of the *De Bardeleden* was rescued by steamer *Laganbank* (Br.) March 10 and taken to Boston. The cutter *Ossipee* was alongside the disabled vessel March 10. The *H. F. De Bardeleben* sank stern first p. m. March 10 about 700 miles east of New York.

New York Maritime Register.—Am. S. S. *Walter D. Munson* encountered heavy storm off Hatteras on March 6, and took several 44° rolls causing some of the cargo to shift, and being blown 90 miles off her course.

Fog.—The numbers of days on which fog was reported during the month in different localities are as follows: Off the Grand Banks, from 8 to 11 days; along the American coast between the fortieth and forty-fifth parallel, on 8 days; along the steamer lanes, east of the thirty-fifth meridian, from 1 to 4 days; not more than 1 day in any other 5° square.

OCEAN GALES AND STORMS, MARCH, 1932

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Veendam, Du. S. S.	New York	Habana	31 36 N	66 02 W	Mar. 1	4 p., 1	Mar. 2	29.22	WSW	W, 9	NW	—, 10	WSW-W-NW.
Anniston City, Am. S. S.	do	Port Said	42 02 N	46 05 W	do	do	Mar. 5	29.30	ESE	SE, 10	S	SE, 10	Steady.
Cerinthus, Br. S. S.	Rouen	Port Arthur	31 55 N	62 08 W	do	4 a., 2	Mar. 3	29.08	W	W, 8	NW	W, 9	W-NW.
West Celeron, Am. S. S.	Limerick	New Orleans	26 20 N	63 00 W	Mar. 2	do	do	29.48	W	W, —	WNW	—, 8	W-WNW.
Steel Engineer, Am. S. S.	Port Said	Boston	42 50 N	60 00 W	Mar. 3	4 a., 3	Mar. 4	28.84	N	N, 5	NNW	N, 10	Steady.
Stuyvesant, Du. S. S.	Dover	Paramaribo	45 29 N	7 45 W	do	4 a., 4	Mar. 5	29.68	NNE	ESE, 4	NNE	NNE, 8	ESE-E-NNE.
Alabama, Am. S. S.	Jacksonville	Port Arthur	26 17 N	86 18 W	Mar. 5	4 p., 5	Mar. 6	29.01	S	S, —	NW	S, 10	S-SSW.
Commercial Orleanean, Am. S. S.	Tampa	New Orleans	29 48 N	84 20 W	do	8 p., 5		29.22	S	SSW, 10		SSW, 10	SSW-NW.
West Ekonk, Am. S. S.	New Orleans	Liverpool	24 40 N	82 40 W	do	4 p., 5	Mar. 7	29.45	S	S, 6	NW	NW, 8	SW-WNW.
Polybius, Am. S. S.	Newcastle-on-Tyne.	Corpus Christi.	39 00 N	36 00 W	Mar. 4	3 p., 5	Mar. 5	29.38	ESE	ESE, 9	ESE	ESE, 10	
Gulfhawk, Am. S. S.	Las Piedras	Philadelphia	34 40 N	75 20 W	Mar. 6	10 a., 6	Mar. 8	28.77	SSE	SSW, 12	NW	SSW, 12	SSE-SSW.
Japan Arrow, Am. S. S.	Beaumont	New York	35 17 N	75 02 W	Mar. 5	7 a., 6		28.85		SE, 10		NW, 12	
Borinquen, Am. S. S.	San Juan	do	36 00 N	72 50 W	Mar. 6	5 p., 6		28.69	S	WSW, —		—, 12	SSE-NW.
Monarch of Bermuda, Br. S. S.	New York	Bermuda	38 55 N	72 10 W	do	9 p., 6		28.35	SE	SW, 11		—, 11	SW-W.
West Gambo, Am. S. S.	Hamburg	New Orleans	31 45 N	68 00 W	Mar. 26	6 p., 6	Mar. 8	29.60	SSW	SSW, 8	NW	WNW, 10	SSW-WSW.
Tennessee, Dan. S. S.	New York	Copenhagen	59 33 N	8 00 W	Mar. 4	11p., 6	Mar. 7	29.12	NW	WNW, 12	WNW	WNW, 12	Steady.
Carnia, Ital. S. S.	Orano	New York	36 15 N	62 40 W	Mar. 6	9 a., 7	Mar. 9	29.35	S	WSW, 9	NW	WNW, 10	S-SW-W-WNW.
Tampa, Am. M. S.	New York	Port Said	40 30 N	65 34 W	do	4 a., 7	Mar. 11	28.81	E	SW, 6	Var.	WNW, 9	
Giulia, Ital. M. S.	Gibraltar	New York	34 40 N	63 20 W	Mar. 5	7 a., 7	Mar. 8	29.53	WSW	SW, 8	WNW	SW, 9	
Atlantian, Br. S. S.	Liverpool	Boston	42 54 N	62 18 W	Mar. 8	8a., 8	Mar. 9	28.68	WSW	W, —	W	W, 9	WSW-W.
Wildwood, Am. S. S.	Sluiskil, Holland.	Charleston	35 10 N	51 20 W	do	6 p., 8	do	29.56	WSW	WSW, 9	WSW	WNW, 10	
Independence Hall, Am. S. S.	New York	Bordeaux	40 00 N	74 00 W	Mar. 9	—, 9	Mar. 14	29.60	W	W, —	W	W, 10	Steady.
Ala, Am. S. S.	Chester, Pa.	Antwerp	39 18 N	70 42 W	do	1 p., 10	Mar. 13	29.70	NW	W, 8	W	W, 9	NW-W.
Nishmaha, Am. S. S.	New Orleans	Havre	35 43 N	64 27 W	do	4 a., 10	do	29.41	SW	—, 10	W	W, 10	SW-W-WNW.
Augustus, Ital. M. S.	Genoa	New York	38 11 N	53 10 W	do	4 p., 10	Mar. 12	29.32	SW	Var., —	NW	—, 10	SW-NW.
Gand, Belg. S. S.	Bordeaux	Habana	36 38 N	29 27 W	Mar. 7	4 a., 10	Mar. 11	29.50	SSE	W, 8	NW	NW, 11	
Cerinthus, Br. S. S.	Rouen	Port Arthur	28 22 N	90 07 W	Mar. 11	8 p., 11	Mar. 12	30.07	ENE	N, 8	N	N, 8	ENE-N.
Frederik VIII, Dan. S. S.	Oslo	Halifax	45 15 N	50 00 W	Mar. 10	10 p., 11	Mar. 13	28.85	ESE	WSW, 7	W	W, 9	Steady.
Steel Exporter, Am. S. S.	Port Said	Savannah	31 42 N	44 30 W	Mar. 11	4 a., 12	do	29.70	WSW	W, 8	W	W, 9	W-WNW.
Breedijk, Du. S. S.	Habana	Rotterdam	47 53 N	30 38 W	do	do	Mar. 12	29.28	SSE	SSE, 8	ESE	ESE, 9	SSE-ESE.
Standard, Am. S. S.	New York	Cartegena	31 28 N	73 35 W	Mar. 14	2 p., 14	Mar. 15	29.50	W	W, —	W	W, 10	Steady.
Nevada, Dan. S. S.	Antwerp	Charleston	44 40 N	51 40 W	do	6 a., 14	do	28.26	ESE	ESE, 6	NW	NW, 10	ESE-SW-W.
Cold Harbor, Am. S. S.	Manchester	Baltimore	42 20 N	55 00 W	do	Noon, 15	Mar. 16	28.54	SE	NW, 12	W	NW, 12	SSE-SW-NW.
Motocarline, Belg. M. S.	Antwerp	Baytown	35 36 N	51 15 W	do	Noon, 15	Mar. 17	29.36	SSW	WSW, —	WNW	WNW, 10	W-WNW.
West Chetac, Am. S. S.	Freetown, W. Africa.	Bermuda	32 47 N	54 04 W	Mar. 16	5 p., 16	do	29.69	W	W, 8	W	W, 8	Steady.
Iowan, Am. S. S.	New York	Canal Zone	34 36 N	74 36 W	Mar. 17	5 a., 17	Mar. 18	29.98	SW	SW	SSW	SW, 9	SW-SSW-NE.
Knoxville City, Am. S. S.	do	do	37 28 N	73 51 W	do	3 p., 17	Mar. 17	29.30	SSW	SW, —	NW	—, 10	SSW-SW.
Steel Exporter, Am. S. S.	Port Said	Savannah	31 29 N	65 30 W	do	6 p., 18	Mar. 19	29.82	SW	SSW, 8	N	SSW, 9	SSW-W-N.
Mobile City, Am. S. S.	Avonmouth	Baltimore	39 45 N	64 13 W	Mar. 22	—, 22	Mar. 23	29.52	SSW	SSW, 8	WNW	S, 9	SSW-S-W-WNW.
Quaker City, Am. S. S.	Hamburg	Boston	47 21 N	35 50 W	Mar. 23	2 p., 23	Mar. 25	29.61	SW	SW, 10	W	SW, 10	
McKeesport, Am. S. S.	Havre	New York	48 24 N	29 38 W	Mar. 24	2 p., 24	Mar. 29	29.15	W	W, 9	NW	WNW, 11	Steady.
Yaka, Am. S. S.	Pensacola	Bremen	40 14 N	56 19 W	do	4 a., 25	Mar. 25	29.79	E	ENE, 8	NE	NE, 9	ENE-NE.
West Chatala, Am. S. S.	Hamburg	Galveston	42 35 N	19 35 W	Mar. 25	1 a., 25	Mar. 26	29.76	W	—, 8	SW	—, 10	W-NW.
Elmsport, Am. S. S.	New Orleans	London	49 15 N	26 10 W	Mar. 23	2 p., 26	Mar. 28	29.13	SW	NW, 8	W	W, 12	W-WNW.
General von Steuben Ger. S. S.	Southampton	New York	49 58 N	10 48 W	Mar. 26	11 a., 26	Mar. 30	29.25	SSE	SSE, 9	N	WNW, 9	W-SW.
Shickshinny, Am. S. S.	Jacksonville	Liverpool	38 40 N	30 00 W	Mar. 23	Mdt. 26	Mar. 29	29.19	W	W, 9	SW	W, 9	Do.
Standard, Am. S. S.	Cartagena	New York	36 25 N	75 11 W	Mar. 27	4a., 28	do	29.27	S	S, —	WNW	—, 10	Steady.
Gulfhawk, Am. S. S.	Philadelphia	Las Piedras	36 40 N	73 40 W	Mar. 28	6a., 28	Mar. 28	29.22	SSW	SSW, 8	NW	NW, 10	SSW-NW.
Alexandre Andre, Belg. M. S.	Rouen	New York	41 30 N	62 01 W	do	6 p., 28	Mar. 30	29.38	SW	SE, 8	NW	W, 9	SW-W-NW.
Geo. H. Jones, Am. S. S.	New York	Baton Rouge	40 20 N	73 53 W	do	3 p., 28	Mar. 28	28.96	WNW	NW, 7	WNW	WNW, 9	Steady.
Irene, Du. S. S.	Puerto Plata	Havre	43 20 N	23 10 W	do	7 a., 29	Mar. 30	29.93	SW	NW, 8	N	NNW, 8	SW-W-N.
Carlton, Am. S. S.	Corunna	Tampa	27 50 N	62 35 W	Mar. 30	5 a., 30	do	30.13	NW	NW, 8	NW	NW, 8	Steady.
Exmouth, Am. S. S.	Seville	New York	36 01 N	56 58 W	do	Noon, 30	Mar. 31	29.85	NNW	NNW, 8	N	N, 9	WNW-NNW.
Winnebago, Br. S. S.	New York	Manchester	49 42 N	22 56 W	Mar. 26	4 a., 30	Apr. 1	29.42	WNW	NW, 9	NE	W, 10	N-NW.
NORTH PACIFIC OCEAN													
Salawati, Du. M. S.	Ternate	Los Angeles	9 31 N	137 38 E	Mar. 2	—, 2	Mar. 2	29.62	NNW	NW, 9	W	NW, 9	NNW-SSW.
Mojave, Am. S. S.	Nagasaki	San Pedro	39 59 N	177 10 W	Mar. 5	4 a, 6	Mar. 6	29.15	ESE	SSE, 9	NW	SSE, 9	SSE-SSW.
Bokuyo Maru, Jap. S. S.	Yokohama	Honolulu	32 46 N	168 26 E	do	do	Mar. 7	29.36	S	S, 6	WNW	SW, 10	S-SW-W.
Manukai, Am. S. S.	San Francisco	Hawaii	30 20 N	142 04 W	do	2 a, 7	Mar. 8	29.53	SE	WSW, 5	SW	WNW, 8	WSW-WNW.
Varanger, Nor. M. S.	Nanking	San Francisco	39. 08 N	180 00	Mar. 6	—, 7	Mar. 7	29.09	S	SSW, 5	WSW	WSW, 9	S-WSW.
Golden Sun, Am. S. S.	Otaru	do	45 29 N	147 47 E	do	2 a, 8	do	29.22	NE	N, 8	SW	NW, 9	
Golden Dragon, Am. S. S.	Tacoma	Yokohama	34 07 N	153 45 W	do	4 a, 6	do	29.71	NW	NW, 7	NW	NW, 9	Steady
Shelton, Am. S. S.	Taku Bar	Seattle	48 11 N	173 16 E	Mar. 7	10 a, 7	Mar. 8	29.49	NNE	NNE, 7	W	NW, 9	NW-W.
Brandywine, Am. S. S.	San Pedro	do	48 25 N	124 46 W	Mar. 8	1 a, 9	Mar. 9	29.29	NE	NE, 8	NE	NE, 9	Steady.
Tacoma, Am. S. S.	Seattle	Yokohama	52 10 N	148 50 W	do	11 p, 9	Mar. 10	29.32	N	N, 9	N	N, 9	Do.
Tatsuta Maru, Jap. M. S.	Honolulu	do	32 21 N	148 12 E	do	1 p, 9	do	29.49	S	WNW, —	N	WNW, 9	
Hakonesan Maru, Jap. M. S.	Yokohama	San Francisco	47 20 N	178 10 E	do	10 p, 9	do	28.70	SE	SE, 8	W	SE, 9	SE-E-SE.
Ozura Maru, Jap. M. S.	Elwood	Yokohama	35 16 N	153 10 E	Mar. 9	8 p, 9	do	29.10	SW	W, 7	NW	W, 9	SW-W-NW.
San Pedro Maru, Jap. M. S.	Monterey	do	32 04 N	158 04 E	do	Mdt, 9	do	29.53	S	W, 9	NW	W, 10	WSW-W-NW.
San Gabriel, Am. S. S.	Los Angeles	Panama	15 00 N	95 00 W	do	4 a, 10	do	29.82	N	N, 8	N	N, 8	
Koyo Maru, Jap. S. S.	Port San Luis	Yokohama	32 17 N	174 48 E	do	6 p, 10	Mar. 14	29.62	S	WSW, —	NNW	W, 9	SW-WSW-W.
Salawati, Du. M. S.	Ternate	Los Angeles	34 00 N	173 07 W	Mar. 10		Mar. 12	29.50	W	WSW, 9	SSE	WSW, 9	W-SSE.
City of Elwood, Am. M. S.	Balboa	San Pedro	12 55 N	93 20 W	Mar. 13	4 p, 13	Mar. 14	29.81	NW	NNW, 5	NE	NNE, 10	NW-N.
Foylebank, Br. M. S.	San Pedro	Osaka	29 03 N	175 00 W	Mar. 15	4 p, 15	Mar. 15	29.58	WNW	WNW, 9	NNW	WNW, 10	WNW-NW.
Ethan Allen, Am. S. S.	Honolulu	Yokohama	33 29 N	141 30 E	do	Noon, 15	Mar. 16	29.86	WNW	WNW, 7	WNW	WNW, 9	Steady.
Granville, Pan. M. S.	Los Angeles	do	33 35 N	142 00 W	Mar. 16	4 p, 16	Mar. 17		S	S, 8	W	—, 10	
Adm. Farragut, Am. S. S.	Portland	San Diego	44 00 N	124 35 W	do	10 p, 16	do	29.90	SE	SE, 7	S	SE, 8	SE-S-SW.

OCEAN GALES AND STORMS, MARCH, 1932—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued			° ′	° ′				*Inches*					
Stuart Dollar, Am. S. S.	Manila	Los Angeles	33 44 N	159 24 E	Mar. 20	4 a, 21	Mar. 21	29.35	SSW	WSW, 7	WNW	WNW, 9	WSW-WNW.
Golden River, Am. S. S.	Hong Kong	San Francisco	[1]39 00 N	150 00 E	do	—, 20	do	29.14			NNW	NNW, 10	
San Luis Maru, Jap. M. S.	Kudamatsu	Los Angeles	46 08 N	177 49 E	Mar. 21	Noon, 21	do	28.27	SE	SE, 4	W	E, 9	SE-E-SE.
California, Am. S. S.	Darien	San Francisco	45 30 N	169 00 W	do	7 a, 21	do	28.77	SE	SSE, —	S	SE, 10	SE-SSE-S.
Granville, Pan. M. S.	Los Angeles	Yokohama	34 20 N	174 43 W	do	4 a, 21	do		WSW	WSW, 8	W	—, 9	
Courageous, Am. M. S.	Shanghai	San Pedro	43 25 N	157 35 W	do	8 p, 21	do	29.31	ENE	SSW, 8	SW	SSE, 10	S-SSW.
Ozura Maru, Jap. M. S.	Yokohama	Los Angeles	37 32 N	152 35 E	Mar. 20	Mdt, 20	Mar. 22	28.55	SE	SW, 6	NW	NW, 11	SE-SW-W.
Bonneville, Nor. M. S.	Bacolod, P. I.	San Pedro	33 45 N	165 55 E	Mar. 21	4 a, 21	do	29.38	SSW	SW, —	WNW	W, 9	
Adm. Peoples, Am. S. S.	Portland	San Diego	44 19 N	124 20 W	Mar. 23	6 a, 24	Mar. 24	29.85	SE	S, 9	SW	S, 9	S-SW.
San Pedro Maru, Jap. M. S.	Yokohama	San Francisco	45 05 N	176 30 W	Mar. 24	4 a, 25	Mar. 26	29.20	WNW	WNW, 7	WSW	WNW, 10	WNW-WSW.
Granville, Pan. M. S.	Los Angeles	Yokohama	34 20 N	165 00 E	Mar. 26	8 a, 26	Mar. 27		W	W, 10	NW	W, 11	
Grays Harbor, Am. S. S.	Legaspi, P. I.	Los Angeles	34 40 N	159 11 E	do	Noon, 26	do	29.45	W	W, 10	NW	W, 10	W-WNW.
Sangstap, Nor. M. S.	San Pedro	Yokohama	33 45 N	169 30 E	do	2 p, 26	Mar. 28	29.51	S	S, 9	NW	W, 10	S-SW-W.
Do	do	do	33 37 N	161 20 E	Mar. 29		Mar. 30		SE		S	S, 9	SE-S.
Silverwalnut, Br. M. S.	San Francisco	do	44 00 N	162 25 E	do	Mdt, 29	do	29.35	SW	SSW, —	WSW	W, 10	S-SSW.
SOUTH PACIFIC OCEAN													
Aorangi, Br. M. S.	Auckland	Honolulu	15 26 S	178 26 W	Mar. 11	Noon, 11	Mar. 12	29.33	SE		NW	WNW, 11	

[1] Position approximate.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—The average atmospheric pressure in the region surrounding the Aleutian Islands was approximately half an inch lower in March than in February. While in the earlier month the average barometer was nearly a third of an inch above the normal, in March it was 0.17 inch below, at both Dutch Harbor and St. Paul. The average center of the LOW this month was near Dutch Harbor, where the mean pressure was 29.53 inches. Along the coast of the United States and over the islands lying immediately south of Japan, pressures for March were somewhat above the normal.

The North Pacific anticyclone fluctuated greatly in stability and area, and from the 4th until nearly the middle of the month was practically nonexistent over the region usually occupied by it in west longitudes, its place being taken by comparatively shallow but extensive cyclonic developments.

In the Far East the continental anticyclone encroached considerably upon the sea area, but was more broken than during the winter by depressions both of continental and of oceanic origin.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean and adjacent waters, March, 1932, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [3]	30.30	+0.15	31.02	11	29.70	31
Dutch Harbor [1]	29.53	−0.17	30.30	8	28.98	19
St. Paul [1]	29.56	−0.17	30.29	9	28.76	31
Kodiak [1]	29.60	−0.09	30.22	8	28.86	18
Juneau [1]	29.91	−0.03	30.42	1	29.36	18
Tatoosh Island [2] [4]	30.00	+0.04	30.45	21	29.38	24
San Francisco [2] [4]	30.11	+0.05	30.34	24	29.75	14
Mazatlan [1] [2]	29.92	−0.07	30.04	13	29.76	6
Honolulu [1]	30.03	−0.01	30.17	23	29.75	8
Midway Island [1]	30.05	−0.02	30.48	29	29.72	13
Guam [1]	29.89	−0.01	29.96	4	29.82	20
Manila [1]	29.89	−0.06	30.00	1	29.80	27
Naha [1] [2]	30.10	+0.10	30.28	20	29.80	27
Chichishima [1]	30.05	+0.05	30.18	[5] 26	29.70	28
Nemuro [1] [2]	29.83	----------	30.26	11	29.52	[5] 27

[1] Data based on 1 daily observation only, with departures computed from best available normals related to time of observation.
[2] Data for 1 to 3 days missing.
[3] A. m. and p. m. observations.
[4] Corrected to 24-hour mean.
[5] And on other date.

Cyclones and gales.—Anticyclones were fewer than normal in middle and higher latitudes this month, and the progressive movement of many cyclonic formations was relatively slight. The pressures in some individual cyclones reached considerable depths locally on some days. However, in many cases a cyclone of moderate depth covered an enormous area, resulting in a wide distribution of unsettled weather, accompanied with more or less sporadic high winds.

In general the heaviest weather, as gathered from reports in hand, occurred between about 30° and 45° N., except that there were comparatively few gales east of longitude 150° W. In these latitudes gales were most frequent west of the one hundred and eightieth meridian, where some 5° squares had at least four days with winds of force 9 to 10.

In only two instances were gales as high as force 11 reported. That of the 26th came with a westerly wind and was experienced by the Panaman motorship *Granville* near 34° N., 164° E.

The factors making up the storm which resulted in the heavy gale of the 21st were a depression, which was of little consequence during its passage between China and Japan on the 18th and 19th, and a LOW which had been hanging simultaneously over northern Japan and the lower Kurile Islands. The two appear to have coalesced east of Honshu on the 20th, with resultant and rapid increase in energy. The storm became so violent locally on the 21st that on that morning, near 37½° N., 153° E., the Japanese motorship *Ozura Maru* encountered a northwest gale of force 11, with barometer depressed to 28.55 inches. On the same date, but in connection with a different storm center, the motorship *San Luis Maru*, near latitude 45° N., longitude 180°, reported a pressure of 28.27 inches (uncorrected), which was the lowest observed barometer reading of the month. In this case the maximum wind force, from the east, was only 9. Southeasterly gales of force 10, also on the 21st, were experienced as far to the eastward as latitude 157° W. This day may be considered as most generally the stormiest of the month.

A period of more scattered though less intense gales was that between the 6th and 10th. During the 6th and 9th winds of force 8 to 9 occurred off the upper coast of the United States; from the 6th to 8th similar forces were encountered over a considerable area north and north-

east of the Hawaiian Islands; strong gales occurred on the 6th to 10th between about 39° N. and the central Aleutians; and strong to whole gales blew on the 6th, 8th,and 9th over a varying stretch of sea between southern Japan and about longitude 170° E.

A glance at the adjoined table of storms and gales will sufficiently call attention to other high winds outside of the Tropics and indicate as well the far less degree of storminess prevailing over the North Pacific than over the North Atlantic this month.

Tehuantepecers.—In the Gulf of Tehuantepec northers of moderate gale force were experienced on the 6th, 12th, 17th, and 28th; of fresh gale force on the 10th; and of whole gale force (10) on the 13th and 14th, during the prevalence of an anticyclone over the western part of the Gulf of Mexico. Off the middle Central American coast a northeaster of force 7 occurred on the 16th.

Tropical cyclones.—No tropical cyclones of consequence occurred this month, but a depression southwest of Guam caused a northwest gale of force 9 on the 2d.

Fog.—There were 10 or more days with fog this month off the central California coast within 100 miles of San Francisco and 7 days within a similar distance of San Diego. Along the upper California and the Oregon and Washington coasts fog was reported on 11 days altogether. Between longitudes 130° and 170° W. latitudes 35° and 50° N., 1 to 4 days with scattered fog, distributed through the month, were experienced in the majority of the 5° squares. The most interesting weather record of March is that relating to the occurrence of dense fog on the 4th to 7th in the Gulf of Panama. Not before in recent years has this phenomenon been reported by seamen in this locality.

CYCLONES IN THE SOUTH INDIAN OCEAN, FEBRUARY, 1932

The London Meteorological Magazine for March, 1932, reports from the Times of February 6–10 that a hurricane which crossed the island of Reunion on February 5 is said to have been the worst ever experienced there. It resulted in the death of at least 45 persons.

Mr. D. Depledge, third officer of the British motor vessel *Athelempress*, en route from England to Java, via the Cape of Good Hope, reports encountering a cyclone on February 15–16. At midnight of the 15th the ship's position was in latitude 31° 15′ S., longitude 53° 24′ E. The gale began from ESE. at 3:20 a. m. of the 16th, and was of force 9 from a southeasterly direction from about 6 a. m. until noon, the vessel then being in 30° 58′ S., 53° 33′ E. The barometer was lowest, 29.32 inches, at 3 p. m., at which time the wind dropped and veered to SW., later increasing to force 8, then changing to NW. by N., force 9. The weather began improving at midnight of the 16th. This storm was moving apparently toward the southwest, which is the usual direction taken by tropical cyclones in these latitudes in the Indian Ocean.

SEA-SURFACE TEMPERATURE OBSERVATIONS, MARCH, 1932

By GILES SLOCUM

Table 1 shows the average surface temperatures of the Caribbean Sea and the Straits of Florida for March, 1932. These figures are based upon about 80 per cent of the observations which will eventually become available. They are, therefore, preliminary, rather than final values. The final revised figures, computed from complete data, will be given at a later date.

CARIBBEAN SEA

The mean surface temperature of the Caribbean Sea for March, 1932, was above the seasonal average throughout the month. This was the warmest March, next to that of 1931, during the 13 years of record (1920–1932), and the twenty-fifth consecutive month with the mean temperature at, or above, the seasonal average.

STRAITS OF FLORIDA

The extremely high sea-surface temperatures, for this season of the year, which prevailed in the Straits of Florida during February, 1932, continued until about March 9. From then until the end of March the temperature anomaly was not more than a few tenths of a degree, although the departures remained positive in sign until the end of the third quarter-month. During the final quarter of the month, however, the average temperature was 0.4° below the 13-year mean. This was the first time a quarter-monthly mean temperature for the Straits of Florida area had been below the seasonal average since the second quarter of November, 1931.

TABLE 1.—*Preliminary mean sea-surface temperatures (°F.) in the Caribbean Sea and Straits of Florida, March, 1932*

Quarter	Period	Caribbean Sea			Straits of Florida		
		Mean (°F.)	Departure from 13-year mean (1920–1932)	Change from preceding month	Mean (°F.)	Departure from 13-year mean (1920–1932)	Change from preceding month
I	Mar. 1–7	79.2	+0.8		76.3	+2.4	
II	Mar. 8–15	79.6	+1.0		75.2	+0.5	
III	Mar. 16–23	79.3	+0.4		75.8	+0.5	
IV	Mar. 24–31	79.7	+0.6		75.3	−0.4	
	Month	79.4	+0.6	+0.7	75.6	+0.7	−1.2

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, March, 1932

[For description of tables and charts, see REVIEW, January, p. 37]

Section	Temperature								Precipitation					
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	51.9	−4.0	Thomasville	89	1	St. Bernard	12	10	4.25	−1.71	Centerville	8.25	Union Springs	1.14
Arizona	52.7	−0.1	Mohawk	96	27	Williams	−6	4	0.32	−0.75	Alpine	1.50	16 stations	0.00
Arkansas	48.2	−4.4	Amity	88	20	Sunset	2	9	4.48	−0.20	Arkadelphia	7.33	Harrison	1.63
California	52.3	+1.7	Westhaven	99	31	4 stations	0	14	1.06	−2.42	Crescent City	14.52	13 stations	0.00
Colorado	31.0	−4.0	Two Buttes	80	19	2 stations	−38	12	1.20	−0.01	Silver Lake	5.89	Buena Vista	T.
Florida	62.4	−3.1	2 stations	94	22	3 stations	21	10	3.51	+0.38	Palatka	6.36	2 stations	0.92
Georgia	53.0	−3.5	Millen	88	3	2 stations	10	10	4.46	−0.52	Clayton	8.85	Savannah (No. 2)	2.23
Idaho	33.5	−2.1	Grand View	78	31	Felt	−27	11	3.18	+1.40	Pete King Ranger Station.	11.98	Arco	T.
Illinois	34.0	−6.8	White Hall	77	29	2 stations	−3	16	2.37	−0.69	Shawneetown	5.60	Pana	0.72
Indiana	34.2	−6.5	2 stations	74	21	Goshen	−4	11	2.83	−0.92	Princeton	5.11	Fowler	1.06
Iowa	28.4	−5.8	Thurman	77	29	2 stations	−8	146	1.46	−0.30	Maquoheta (near)	2.93	Logan	0.44
Kansas	36.9	−6.7	2 stations	84	29	Tribune	−12	12	0.89	−0.59	Elkhart	2.32	Atwood	0.21
Kentucky	41.2	−5.1	do	80	2	Mount Sterling	4	9	4.95	+0.26	Woodbury	6.61	Carrollton	2.44
Louisiana	56.3	−4.4	Monroe	87	20	Plain Dealing	18	9	3.31	−1.43	Minden	6.76	Atchafalaya	0.25
Maryland-Delaware	38.5	−4.5	2 stations	75	30	Oakland, Md	−4	16	5.78	+2.34	Friendsville, Md	7.76	Crisfield, Md	3.61
Michigan	25.3	−4.3	Croswell	67	30	Bessemer	−15	17	1.63	−0.54	Painesdale	4.84	Vanderbilt (near)	0.29
Minnesota	18.8	−7.2	Beardsley	66	29	Big Falls	−31	11	0.84	−0.25	New Ulm	2.55	Alexandria	0.08
Mississippi	52.6	−4.1	State College	89	20	Duck Hill	11	10	4.29	−1.45	Edinburg	7.79	Biloxi	2.20
Missouri	38.3	−5.6	Neosho	81	20	Unionville	−2	16	1.89	−1.13	Caruthersville	4.84	Warrensburg	0.30
Montana	24.7	−5.5	Bridger	72	31	Harlowton	−40	8	1.40	+0.58	Heron	6.32	Kenilworth (near)	0.18
Nebraska	30.3	−5.6	Culbertson	86	31	Gordon	−23	10	0.80	−0.30	Gordon	2.23	Arthur	T.
Nevada	43.1	+0.8	2 stations	90	19	Elko	−5	4	0.52	−0.34	Mahoney Ranger Station.	3.76	5 stations	0.00
New England	29.5	−2.8	do	63	31	2 stations	−13	19	4.08	+0.80	Hingham, Mass	6.96	Bethlehem, N. H.	1.18
New Jersey	36.7	−1.9	Boonton	69	26	Culvers Lake	3	15	5.49	+1.40	Lakewood	7.70	Woodcliff Lake	3.91
New Mexico	40.5	−2.7	Lovington	88	20	2 stations	−16	12	0.73	−0.11	Cloudcroft	4.01	Chamberino	0.00
New York	28.7	−3.4	4 stations	68	30	Stillwater Reservoir	−22	16	4.01	+1.00	Chasm Falls	6.70	Caneadea Dam	1.41
North Carolina	46.4	−3.4	2 stations	85	21	Mount Mitchell	−11	10	4.55	+0.35	Highlands	8.23	Red Springs	2.10
North Dakota	18.9	−5.2	Hankinson	64	29	Powers Lake	−30	22	0.63	−0.07	Alpha	2.40	2 stations	T.
Ohio	33.7	−5.7	Athens	78	25	3 stations	−1	9	2.92	−0.45	Ironton	6.08	Put-in-Bay	1.18
Oklahoma	46.0	−5.1	Tishomingo	94	20	Kenton	−16	12	0.99	−1.24	Idabel	4.65	Perry	0.07
Oregon	41.9	+1.0	3 stations	78	31	Seneca	−12	4	4.75	+1.99	Brookings	20.33	Paisley	0.57
Pennsylvania	33.4	−4.3	Hyndman	72	30	Somerset	−8	16	4.41	+0.97	West Chester	7.46	Ansonia	1.63
South Carolina	51.4	−3.2	2 stations	86	3	Caesars Head	5	10	3.67	−0.27	Walhalla	8.32	Pinopolis	1.56
South Dakota	25.0	−6.9	Forestburg	77	29	Oelrichs	−22	7	1.01	−0.03	Hot Springs	4.20	Dowling	0.19
Tennessee	45.2	−4.1	3 stations	84	20	Elkmont	5	10	4.89	−0.42	Elkmont	9.64	Fayetteville	3.14
Texas	53.8	−4.9	2 stations	102	20	Dalhart	−5	12	1.44	−0.64	Marshall	5.30	9 stations	0.00
Utah	36.8	−1.5	St. George	81	19	Woodruff	−25	12	1.31	−0.27	Silver Lake	6.13	2 stations	0.00
Virginia	41.8	−4.2	Christchurch	84	22	Dante	1	15	5.18	+1.48	Farmville	8.07	Diamond Springs	2.95
Washington	41.1	+0.1	3 stations	74	18	Newport	−8	11	6.57	+2.68	Big Four	29.53	Toppenish	0.43
West Virginia	36.6	−6.1	2 stations	80	21	Cairo	−3	9	5.32	+1.39	Pickens	9.79	Lewisburg	2.25
Wisconsin	22.4	−6.9	Brodhead	71	29	Prentice	−23	11	1.12	−0.60	Brodhead	3.58	Mellen	0.33
Wyoming	24.1	−5.4	Thermopolis	71	31	Riverside	−43	11	1.23	+0.14	Bechler River	9.71	Diversion Dam	0.07
Alaska (February)	−0.6	−10.1	Dutch Harbor	60	5	Tanana	−63	26	2.80	+0.81	Ketchikan	16.47	Barrow	0.01
Hawaii	69.4	+0.3	Waipahu	90	26	Kanalohuluhulu	36	17	5.09	−3.90	Olowalu (Mauka)	28.00	Ka Lae	0.42
Porto Rico	74.9	+1.2	Mayaguez	95	14	Guineo Reservoir	40	6	2.76	−0.72	Rio Blanco	10.43	Canovanas	0.59

[1] Other dates also.

TABLE 1.—*Climatological data for Weather Bureau stations, March, 1932*

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with .01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
	Ft.	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	°*F.*	°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	°*F.*	°*F.*	°*F.*	%	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
New England							31.9	−0.8										70	4.19	+0.7										5.6		
Eastport	76	67	85	29.54	29.62	−.31	28.2	−0.7	48	27	35	4	15	22	19	25	19	71	2.67	−1.2	14	11,153	w.	42	ne	28	6	5	20	7.0	14.6	0.0
Greenville, Me.	1,070	6	----	28.47	29.67	------	21.2	------	48	31	30	−4	15	13	36	----	----	----	3.50	------	11	7,801	nw.	31	------	2	8	6	17	----	32.5	----
Portland, Me.	103	82	117	29.56	29.69	−.27	31.4	−0.4	56	27	38	10	15	24	22	27	18	61	4.35	+0.5	13	8,710	nw.	36	s.	31	14	8	9	5.0	17.7	T.
Concord	289	70	79	29.39	29.71	−.29	30.4	−0.4	56	26	39	7	15	22	29	----	----	----	2.70	−0.3	11	6,418	nw.	22	nw.	29	14	7	10	4.6	15.3	T.
Burlington	403	11	48	29.31	29.77	−.23	25.1	−4.0	48	31	32	4	15	18	31	----	----	----	3.06	+1.0	13	9,132	nw.	34	s.	19	6	10	15	6.7	22.1	T.
Northfield	876	12	60	28.78	29.76	−.24	24.4	−2.0	50	30	33	2	15	16	35	21	16	73	3.02	+0.5	12	7,031	n.	27	n.	28	4	11	16	7.0	18.9	4.2
Boston	125	106	165	29.57	29.71	−.26	35.6	0.0	63	31	43	12	15	28	26	31	23	63	5.28	+1.7	12	8,440	nw.	32	s.	31	13	8	10	4.9	5.8	0.0
Nantucket	12	14	90	29.69	29.70	−.28	35.2	−0.3	53	27	41	15	15	29	21	32	27	73	4.52	+0.8	11	13,630	w.	47	e.	6	10	7	14	5.7	4.5	0.0
Block Island	26	11	46	29.69	29.72	−.26	35.1	−0.3	51	28	41	15	15	30	19	33	29	78	4.68	+0.8	11	15,874	w.	53	e.	6	14	5	12	5.5	2.2	0.0
Providence	160	215	251	29.55	29.72	−.26	35.1	−0.6	61	31	43	12	15	27	23	30	23	63	4.69	+1.2	9	12,109	nw.	47	nw.	8	14	6	11	4.7	1.3	0.0
Hartford	159	122	----	29.58	29.76	−.23	34.7	−0.3	56	2	42	12	15	28	24	----	----	----	4.89	+1.0	10	------	nw.	----	----	----	11	8	12	5.4	2.3	0.0
New Haven	106	74	153	29.65	29.77	−.22	35.8	0.0	58	2	43	14	15	28	28	32	27	73	6.28	+2.2	12	8,597	nw.	35	sw.	31	12	8	11	5.5	1.9	0.0
Middle Atlantic States							38.5	−2.3										66	5.08	+1.6									5.9		
Albany	97	107	115	29.69	29.80	−.21	31.6	−1.1	53	26	38	8	15	25	26	27	21	67	2.73	+0.1	11	7,463	n.	30	n.	28	14	7	10	5.1	17.2	T.
Binghamton	871	10	84	28.86	29.81	−.21	30.0	−2.6	55	30	37	7	9	23	33	----	----	----	4.14	+1.5	15	6,637	nw.	31	nw.	28	2	7	22	8.3	28.2	1.5
New York	314	414	454	29.44	29.79	−.21	37.0	−0.7	61	26	45	13	10	29	23	31	23	60	5.52	+1.9	10	15,505	nw.	62	nw.	7	11	8	12	5.8	0.7	0.0
Bellefonte	1,050	5	36	28.72	29.85	------	30.7	------	58	25	39	4	9	23	38	27	23	78	3.56	------	13	------	w.	52	w.	22	3	9	19	7.8	24.0	T.
Harrisburg	374	94	104	29.44	29.85	−.18	36.0	−2.9	68	30	44	12	10	28	34	30	23	62	5.80	+2.8	11	8,051	nw.	32	w.	22	10	11	10	6.0	10.7	0.0
Philadelphia	114	123	367	29.72	29.85	−.17	39.4	−1.4	63	26	46	17	10	32	24	34	25	59	7.43	+4.0	12	11,773	nw.	44	ne.	6	7	10	14	6.0	5.8	0.0
Reading	325	81	103	29.48	29.84	------	36.3	−3.7	62	30	44	11	10	29	30	31	24	63	5.97	+2.4	10	7,565	nw.	34	w.	22	7	13	11	6.3	9.8	0.0
Scranton	805	72	103	28.97	29.86	−.16	32.1	−3.6	59	30	39	8	9	25	34	28	23	69	4.34	+1.1	12	6,813	nw.	34	nw.	7	5	11	15	6.7	15.7	T.
Atlantic City	52	37	172	------	29.84	−.18	38.2	−0.4	61	22	45	15	10	31	24	----	----	----	5.81	+2.2	10	14,447	w.	62	ne.	6	9	12	10	----	2.1	0.0
Cape May	17	13	49	----	----	----	39.2	−1.6	61	22	46	18	10	32	29	35	29	72	4.66	+0.9	10	------	nw.	----	----	----	1	18	12	----	2.1	0.0
Sandy Hook	22	10	55	29.76	29.79	------	37.4	------	62	26	44	16	10	31	19	33	28	72	5.60	+1.6	10	14,839	nw.	53	ne.	6	8	12	11	5.5	0.1	0.0
Trenton	190	159	183	29.61	29.82	------	36.8	−2.3	64	26	45	13	10	29	26	32	25	65	5.59	+2.2	11	11,112	nw.	46	ne.	6	10	10	11	5.8	1.8	0.0
Baltimore	123	100	215	29.73	29.86	−.17	40.3	−2.0	64	26	48	16	10	32	30	34	27	62	6.48	+2.8	10	10,541	nw.	47	sw.	7	14	8	9	5.1	2.7	0.0
Washington	112	62	85	29.76	29.88	−.16	40.0	−2.6	71	30	49	14	10	31	36	33	25	60	6.45	+2.7	11	7,804	nw.	36	nw.	6	12	10	9	5.1	4.0	0.0
Cape Henry	18	8	54	29.86	29.88	------	45.6	−1.0	82	22	54	21	10	38	39	40	34	67	3.43	−0.4	10	11,396	n.	54	e.	6	7	16	8	5.5	0.4	0.0
Lynchburg	681	153	188	29.15	29.90	−.15	43.4	−3.9	73	26	53	15	10	34	38	37	28	59	4.80	+1.3	8	7,228	nw.	39	nw.	6	10	11	10	5.5	0.8	0.0
Norfolk	91	170	205	29.80	29.90	−.13	46.4	−1.8	80	22	55	18	10	37	37	40	34	68	3.13	−0.6	10	11,738	s	56	w.	6	8	10	13	5.7	1.7	0.0
Richmond	144	11	52	29.74	29.90	−.14	43.9	−3.3	75	22	54	16	10	33	35	38	32	68	6.21	+2.5	8	8,104	nw.	38	n.	6	9	14	8	5.1	2.6	0.0
Wytheville	2,304	49	55	27.49	29.92	−.13	38.2	−4.1	68	26	48	9	10	28	34	32	26	67	3.41	0.0	14	6,767	w.	34	w.	22	10	11	10	5.6	4.5	0.0
South Atlantic States							51.7	−2.0										63	4.28	+0.5									4.7		
Asheville	2,253	89	104	27.56	29.96	−.10	42.6	−2.3	74	20	53	10	10	32	42	35	27	63	3.47	−0.5	13	7,763	nw.	34	nw.	6	13	10	8	4.6	0.7	0.0
Charlotte	779	55	62	29.08	29.92	−.13	49.0	−1.4	79	21	59	17	10	39	32	41	33	58	5.39	+1.2	10	5,978	sw.	30	sw.	22	12	10	9	4.8	0.2	0.0
Greensboro	886	6	56	28.95	29.92	------	44.0	------	76	21	56	15	10	32	38	37	30	64	6.26	------	10	7,731	nw.	42	sw.	22	12	9	10	5.3	1.7	0.0
Hatteras	11	5	50	------	29.91	−.13	50.1	−1.9	72	27	57	25	10	43	30	----	----	76	4.88	+0.6	11	12,413	nw.	56	w.	6	11	11	9	----	T.	0.0
Raleigh	376	103	146	29.50	29.91	−.14	48.0	−2.2	78	21	59	16	10	37	38	40	31	57	6.23	+2.4	12	8,370	nw.	40	nw.	6	11	9	11	5.4	3.3	0.0
Wilmington	72	73	106	29.86	29.93	−.12	51.8	−1.5	79	20	62	21	10	42	30	46	40	68	3.94	+0.8	12	9,436	nw.	49	sw.	28	12	11	8	4.7	T.	0.0
Charleston	48	11	92	29.90	29.95	−.11	55.4	−2.0	82	22	64	28	10	47	31	49	44	71	2.62	−0.4	10	9,222	sw.	40	s.	6	13	9	9	4.6	0.0	0.0
Columbia, S. C.	351	41	57	29.56	29.94	−.12	52.6	−2.6	82	21	63	19	10	42	32	44	35	58	3.03	−0.4	9	7,148	w.	35	sw.	28	13	8	10	4.9	3.5	0.0
Due West	711	10	55	29.18	29.97	------	50.0	------	79	1	61	17	10	39	34	----	----	----	3.21	------	10	8,463	w.	42	s.	22	13	7	11	4.8	T.	0.0
Greenville, S. C.	1,039	139	146	28.82	29.92	------	49.6	−0.3	77	1	60	17	10	40	29	41	31	56	5.41	+0.3	10	7,544	sw.	49	sw.	22	16	5	10	4.3	T.	0.0
Augusta	182	62	77	29.74	29.94	−.12	53.9	−2.1	81	1	65	22	10	43	32	45	58	58	4.74	+0.6	11	5,545	nw.	30	s.	27	16	5	10	3.9	1.7	0.0
Savannah	65	150	194	29.89	29.96	−.10	56.4	−2.6	84	22	66	24	10	46	33	48	41	65	2.34	−0.7	10	10,568	w.	48	w.	6	18	6	7	3.8	0.0	0.0
Jacksonville	43	209	245	29.94	29.99	−.07	59.2	−3.4	83	21	69	26	10	49	30	50	44	66	5.05	+2.1	12	9,638	nw.	49	sw.	6	12	9	10	5.0	0.0	0.0
Florida Peninsula							68.2	−1.6										75	1.82	−0.2									5.2		
Key West	22	10	64	29.96	29.98	−.07	72.6	0.0	85	22	78	57	8	67	18	66	63	75	0.92	−0.5	5	8,416	n.	40	sw.	6	10	12	9	5.2	0.0	0.0
Miami	25	124	168	29.97	30.00	−.08	68.7	−1.5	84	4	77	39	14	60	29	62	59	76	1.85	−0.3	6	8,891	se.	41	sw.	6	9	9	13	5.9	0.0	0.0
Tampa	35	86	197	29.96	30.00	−.07	63.4	−3.4	85	26	74	35	10	53	30	56	52	75	2.68	+0.2	9	9,264	n.	40	nw.	6	8	13	10	5.6	0.0	0.0
Titusville	44	5	----	29.94	29.99	------	63.2	------	90	22	74	32	14	52	35	----	----	----	2.94	------	8	------	nw.	----	----	----	17	7	7	4.3	0.0	0.0
East Gulf States							53.4	−4.1										67	4.39	−0.7									4.8		
Atlanta	1,173	190	198	28.72	29.97	−.09	48.8	−3.2	80	2	58	15	10	39	31	41	34	62	4.53	−0.8	11	8,828	nw.	41	sw.	27	12	9	10	4.8	0.5	0.0
Macon	370	78	87	29.58	29.98	−.08	53.0	−3.7	82	3	65	19	10	41	35	44	36	58	4.09	−0.9	11	6,572	nw.	31	s.	27	17	6	8	4.1	T.	0.0
Thomasville	273	49	103	29.70	30.00	−.06	56.4	−3.8	83	2	67	22	10	46	32	49	43	70	4.86	+0.8	12	7,229	nw.	32	s.	27	12	9	10	5.2	0.0	0.0
Apalachicola	36	11	51	29.97	30.01	------	57.9	------	80	2	66	28	10	50	27	53	40	76	5.33	+1.1	9	7,433	nw.	32	e.	5	15	8	8	4.4	0.0	0.0
Pensacola	56	149	185	29.96	30.02	−.04	55.6	−4.7	75	4	63	23	10	48	24	52	48	80	2.02	−2.8	5	10,438	n.	35	sw.	27	14	8	9	4.6	0.0	0.0
Anniston	741	9	57	----	----	----	49.3	−3.2	82	2	60	16	10	38	37	----	----	----	5.83	------	9	5,275	nw.	24	w.	27	14	7	10	----	T.	0.0
Birmingham	700	11	48	29.23	30.00	−.06	50.4	−5.0	82	2	61	16	10	40	33	42	35	61	5.23	−0.5	8	6,502	nw.	34	w.	27	14	6	11	4.7	0.3	0.0
Mobile	57	125	161	29.95	30.01	−.05	55.6	−4.1	78	27	64	24	10	47	30	50	44	72	3.33	−2.6	9	8,509	s.	31	nw.	6	12	7	12	5.1	0.0	0.0
Montgomery	223	100	112	29.76	30.01	−.05	53.6	−4.2	83	20	64	20	10	43	29	45	37	59	4.17	−1.8	11	6,703	nw.	28	nw.	27	15	5	11	4.9	0.1	0.0
Corinth	469	6	----	----	----	----	49.4	------	88	2	61	16	9	38	37	----	----	----	4.14	------	9	------	n.	----	----	----	5	19	7	----	T.	0.0
Meridian	378	87	95	29.61	30.01	−.04	52.6	−4.5	83	20	63	20	10	42	38	45	37	63	5.58	+0.4	7	5,886	nw.	34	w.	27	14	6	11	4.7	T.	0.0
Vicksburg	247	65	73	29.75	30.04	.00	53.4	−5.1	81	20	62	22	10	45	29	46	39	62	6.64	+1.1	9	7,154	n.	32	w.	27	9	10	12	5.7	T.	0.0
New Orleans	53	76	84	29.97	30.02	−.02	58.8	−4.0	83	21	68	28	10	50	27	51	46	69	2.54	−2.2	9	6,301	sw.	24	sw.	27	9	12	10	5.1	0.0	0.0
West Gulf States							54.4	−4.8										66	2.37	−0.4									5.0		
Shreveport	249	204	220	29.74	30.01	−.01	54.0	−4.3	84	20	63	20	9	45	38	47	39	63	5.95	+1.8	9	10,011	s.	40	nw.	21	13	9	9	5.1	0.1	0.0
Bentonville	1,303	11	44	28.58	29.97	−.04	42.8	−4.5	80	20	53	7	9	32	37	----	----	----	2.07	------	9	6,356	s.	29	s.	29	16	6	9	----	1.0	0.0
Fort Smith	457	79	94	29.50	29.99	−.02	48.0	−4.6	86	20	59	13	9	37	41	41	33	61	2.88	−0.1	14	7,300	nw.	38	w.	21	9	11	11	5.8	1.5	0.0
Little Rock	357	136	153	29.62	30.01	−.02	49.4	−3.6	84	20	59	15	9	40	39	41	32	57	5.23	+0.6	11	8,180	n.	38	sw.	21	9	8	14	6.0	0.1	0.0
Austin	605	136	148	29.37	30.01	------	55.4	−5.3	88	20	67	23	13	44	37	47	40	63	2.15	−0.2	9	8,181	n.	34	nw.	21	14	6	11	4.7	0.4	0.0
Brownsville	57	83	100	29.93	29.99	------	62.8	−5.4	90	21	72	32	11	54	31	56	52	76	2.39	+1.1	6	9,675	se.	38	nw.	5	12	9	10	5.3	0.0	0.0
Corpus Christi	20	11	78	30.00	30.02	+.04	60.3	−4.7	88	21	68	30	11	52	29	54	50	75	1.50	−0.1	7	9,836	se.	34	se.	20	8	7	16	6.3	0.2	0.0
Dallas	512	220	227	29.46	30.02	------	52.4	------	89	20	64	20	9	41	38	----	----	----	1.18	−1.7	7	11,050	n.	44	w.	21	18	6	7	3.8	0.4	0.0
Fort Worth	670	106	114	29.27	29.99	+.01	54.1	−3.6	91	20	66	22	9	42	39	43	33	51	0.63	−1.7	4	7,627	nw.	33	s.	21	14	6	11	5.2	T.	0.0
Galveston	54	106	114	29.94	30.00	−.01	58.2	−4.2	81	21	64	30	10	52	29	53	49	76	1.10	−1.6	8	8,467	se.	38	n.	5	12	9	10	4.9	T	0.0
Houston	138	292	314	29.88	30.03	------	57.7	−5.6	84	19	67	27	9	49	31	----	----	----	1.22	−2.3	6	10,675	s.	46	nw.	27	14	6	11	4.9	0.8	0.0
Palestine	510	64	72	29.49	30.02	+.02	53.4	−5.7	84	20	64	21	9	43	36	47	40	66	3.50	0.0	10	7,680	s.	30	nw.	27	16	5	10	4.5	1.2	0.0
Port Arthur	34	58	63	29.97	30.01	------	57.6	------	86	21	66	29	13	50	31	----	----	----	1.68	------	8	7,588	s.	32	nw.	27	12	14	5	4.5	T.	0.0
San Antonio	693	242	301	29.27	30.00	+.02	57.4	−5.4	88	19	68	24	13	46	39	51	45	68	1.05	−0.8	4	9,633	n.	44	n.	4	13	11	7	4.6	T.	0.0
Taylor	571	38	51	29.44	30.05	+.06	54.1	−5.6	88	20	66	22	13	42	40	----	----	----	2.03	−0.1	7	8,328	s.	30	nw.	27	15	8	8	4.4	T.	0.0

TABLE 1.—*Climatological data for Weather Bureau stations, March, 1932*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours.	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with .01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
Ohio Valley and Tennessee	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*° F.*	*° F.*	*°F.*		*°F.*	*°F.*		*°F.*	*°F.*	*°F.*	*°F.*	*%*	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
							38.8	−5.4										69	3.84	−0.3										6.7		
Chattanooga	762	190	215	29.16	29.98	−0.08	47.0	−4.2	80	2	57	16	6	37	32	40	31	58	6.18	+0.4	9	7,094	nw.	45	sw.	21	12	7	12	5.4	T.	0.0
Knoxville	995	102	111	28.89	29.97	−.09	45.6	−3.1	77	20	55	15	10	36	30	38	30	59	4.88	−0.2	12	6,330	sw.	30	sw.	26	9	8	14	5.9	0.8	0.0
Memphis	399	78	86	29.57	30.00	−.04	47.8	−4.5	83	20	56	14	9	39	38	42	36	64	4.28	−1.0	11	7,398	n.	38	w.	21	11	8	12	5.7	T.	0.0
Nashville	546	168	191	29.42	30.02	−.03	44.4	−4.8	80	20	54	12	9	35	31	39	34	69	4.89	−0.2	10	8,370	nw.	38	nw.	27	9	11	11	5.9	0.3	0.0
Lexington	989	193	230	28.90	30.00	−.05	37.0	−6.7	71	21	46	5	9	28	33				4.95	+0.6	15	10,848	nw.	44	w.	22	9	11	11	5.7	2.0	0.0
Louisville	525	188	234	29.40	30.00	−.05	38.7	−6.7	71	21	47	6	9	30	31	34	28	70	3.92	−0.5	10	9,313	nw.	37	n.	27	4	11	16	7.1	1.6	0.0
Evansville	431	76	116	29.52	30.00	−.04	39.6	−6.3	71	21	48	10	9	31	33	35	30	70	3.60	−0.6	18	8,438	nw.	41	sw.	30	7	12	12	5.8	3.6	0.0
Indianapolis	822	194	230	29.06	29.97	−.07	33.3	−6.7	67	29	42	4	9	25	31	29	24	72	1.96	−2.0	12	9,719	w.	29	nw.	22	3	12	16	7.3	2.0	0.0
Royal Center	736	11	55	29.14	29.97	------	29.3	------	65	29	38	2	9	21	35				2.53	−0.4	13	9,018	w.	30	w.	6	1	11	19	7.6	4.8	0.0
Terre Haute	575	96	129	29.34	29.98	------	35.2	------	69	29	44	7	9	27	32	31	26	72	1.74	−2.0	14	8,504	nw.	30	n.	21	7	5	19	6.5	3.8	0.0
Cincinnati	627	11	51	29.28	29.98	−.07	36.2	−4.7	67	25	45	6	9	27	34	31	26	74	3.22	−0.7	15	7,722	sw.	30	sw.	22	4	10	17	7.0	1.6	0.0
Columbus	822	216	230	29.05	29.95	−.09	34.6	−4.5	62	30	43	5	9	26	30	30	25	71	2.20	−1.3	17	10,549	w.	36	w.	22	2	12	17	7.5	1.7	T.
Dayton	899	137	173	28.98	29.97	------	34.3	−6.2	65	25	42	5	9	26	30	30	25	74	3.02	−0.7	15	8,328	nw.	34	s.	21	1	19	11	7.0	1.6	0.0
Elkins	1,947	59	67	27.84	29.96	−.09	33.6	−6.4	69	21	43	5	9	24	43	29	25	75	7.06	+3.3	15	6,146	w.	29	w.	31	2	7	22	8.0	12.9	0 2
Parkersburg	637	77	82	29.28	29.96	−.09	37.6	−5.2	75	21	46	9	9	29	40	32	26	68	3.72	+0.2	17	6,567	sw.	35	se.	22	9	5	17	6.4	3.0	0 0
Pittsburgh	842	353	410	29.00	29.92	−.12	33.6	−6.0	67	30	42	5	9	26	32	29	24	69	3.24	+0.2	16	9,229	w.	41	w.	22	0	9	22	8.3	8.2	T.
Lower Lake Region							29.4	−3.5										74	3.70	+1.0										7.7		
Buffalo	767	243	280	28.99	29.84	−.18	28.5	−2.6	59	30	34	7	9	23	27	26	22	79	3.35	+0.8	18	13,826	w.	53	w.	7	0	11	20	8.2	21.6	3.0
Canton	448	10	61	29.29	29.79	------	23.0	−4.7	54	30	32	−3	21	14	33				4.08	+1.6	17	7,708	w.	34	w.	19	9	9	13	5.8	29.1	1.0
Ithaca	836	74	100	28.90	29.83	------	30.4	−1.4	53	30	38	6	9	23	30	27	22	73	4.55	+2.2	13	9,261	nw.	32	se.	22	3	6	22	8.1	29.3	1.0
Oswego	335	71	85	29.44	29.82	−.19	29.0	−2.2	55	30	34	9	9	24	25	26	21	72	4.96	+2.4	19	10,481	nw.	38	n	28	2	4	25	8.2	42.5	2.3
Rochester	523	86	102	29.26	29.85	−.17	29.7	−2.1	65	30	36	8	9	24	31	26	22	72	4.77	+2.0	18	8,475	w.	32	sw.	19	3	6	22	7.9	32.1	3.0
Syracuse	596	65	70	29.15	29.81	−.21	29.5	−1.9	56	30	36	8	15	23	27				5.82	+2.8	19	6,693	w.	28	sw.	22	2	10	19	8.0	41.4	1.0
Erie	714	130	166	29.10	29.89	−.13	30.3	−3.2	68	30	36	5	9	24	34	27	23	76	3.44	+0.8	15	11,437	w.	44	sw.	30	3	4	24	8.1	19.9	2.0
Cleveland	762	267	337	29.06	29.90	−.13	31.0	−3.6	66	30	37	6	9	25	30	27	22	72	3.39	+0.7	17	12,055	w.	45	s.	30	2	5	24	8.4	12.0	T.
Sandusky	629	5	67	29.23	29.93	−.10	31.6	−3.5	65	30	38	5	9	25	32				3.62	+0.9	13	8,637	w.	30	sw.	30	0	12	19	7.6	4.9	T.
Toledo	628	208	243	29.24	29.94	−.09	30.8	−4.5	60	30	38	4	9	24	32	27	21	67	1.98	−0.6	10	10,713	w.	41	sw.	30	3	12	16	7.3	8.2	T.
Fort Wayne	856	100	119	29.00	29.96	------	29.8	−9.1	61	29	37	2	9	23	29	27	23	80	1.97	−1.2	13	8,570	w.	30	s.	30	2	10	19	7.7	3.3	0.0
Detroit	730	218	258	29.11	29.92	−.11	29.8	−3.6	58	30	36	5	9	23	21	27	23	78	2.15	−0.2	14	8,999	sw.	38	sw.	30	2	14	15	6.9	11.7	0.0
Upper Lake Region							24.8	−3.5										77	1.89	−0.3										7.4		
Alpena	609	13	89	29.21	29.90	−.13	24.6	−0.9	62	30	32	4	10	18	30	22	17	73	0.95	−1.0	15	9,413	nw.	31	sw.	30	0	12	19	7.7	9.3	0.0
Escanaba	612	54	60	29.25	29.94	−.10	22.0	−2.2	48	30	29	−2	8	15	23	20	16	80	1.33	−0.6	10	7,922	nw.	29	nw.	9	6	9	16	7.0	9.0	0.0
Grand Haven	632	54	89	29.23	29.94	−.09	27.4	−4.3	58	29	33	7	8	22	31	25	23	84	2.35	0.0	16	9,249	w.	35	w.	7	1	5	25	8.9	32.1	0.0
Grand Rapids	707	70	244	29.15	29.94	−.09	28.4	−5.0	59	30	34	7	8	22	25	25	21	76	2.37	−0.1	14	8,957	w.	35	sw.	30	2	7	22	8.2	25.3	0.0
Houghton	668	64	99	29.17	29.92	−.12	20.2	−2.6	43	29	27	−6	15	14	39				2.55	+0.6	17	7,736	w.	29	w.	7	5	6	20	7.4	25.9	7.5
Lansing	878	6	88	28.95	29.91	------	26.3	−5.9	55	30	34	2	9	19	26	25	23	89	2.09	−0.3	15	8,275	w.	29	w.	7	0	13	18	7.9	19.1	T.
Ludington	637	60	66	29.21	29.92	------	27.2	−2.9	57	29	33	5	8	22	30	25	21	77	1.47	−0.8	17	8,633	w.	31	s.	30	2	8	21	7.8	12.3	0.0
Marquette	734	77	111	29.09	29.92	−.12	23.2	−1.6	50	30	30	1	8	17	24	20	16	80	2.00	−0.3	17	9,342	w.	35	nw.	9	2	6	23	8.0	19.7	0.3
Port Huron	638	70	120	29.18	29.89	−.14	28.0	−2.4	56	30	34	5	9	22	21	25	21	77	2.86	+0.8	14	9,670	nw.	32	n.	22	0	11	20	8.0	21.4	T.
Sault Sainte Marie	614	11	52	29.19	29.91	−.12	21.0	−0.6	50	30	29	−7	14	14	23	19	16	84	1.44	−0.4	15	6,905	nw.	30	nw.	7	3	13	15	7.1	9.9	T.
Chicago	673	7	131	29.22	29.97	−.06	30.1	−5.2	66	29	36	2	8	24	29	26	21	70	3.10	+0.5	14	9,227	nw.	29	ne.	21	7	10	14	6.1	11.3	0.0
Green Bay	617	109	141	29.25	29.94	−.10	24.4	−4.2	53	30	32	−5	7	17	24	21	14	65	0.95	−1.1	10	8,471	w.	32	w.	30	6	8	17	7.0	10.0	0.0
Milwaukee	681	125	221	29.19	29.95	−.08	27.7	−4.4	58	30	34	−2	7	21	31	24	19	72	2.20	−0.2	10	10,576	nw.	39	sw.	30	7	10	14	6.4	17.5	0.0
Duluth	1,133	5	47	28.70	29.97	−.09	17.2	−6.5	41	29	26	−15	7	8	29	14	10	75	0.86	−0.7	11	8,758	nw.	49	nw.	6	12	6	13	5.5	8.3	T.
North Dakota							18.6	−3.8										80	0.67	−0.2										6.4		
Moorhead	940	50	58	29.00	30.07	−.01	17.8	−4.9	53	29	26	−10	7	9	39	16	13	80	0.74	−0.3	10	7,941	nw.	28	nw.	30	3	9	19	7.6	11.4	T
Bismarck	1,674	8	57	28.22	30.08	+.02	20.5	−3.7	55	24	29	−17	6	12	33	19	15	79	0.73	−0.2	10	7,969	nw.	32	nw.	8	9	14	8	5.4	7.8	0.0
Devils Lake	1,478	11	44	28.42	30.07	+.02	16.2	−3.8	50	24	24	−17	7	8	33	14	11	82	0.72	−0.1	12	8,457	nw.	30	nw.	7	3	14	14	6.9	8.4	T.
Ellendale	1,457	10	56	28.44	30.06	------	20.3	------	55	24	29	−14	7	12	32				0.25	−0.6	11	10,944	nw.	44	nw.	8	3	14	14	7.0	4.2	T.
Grand Forks	833	12	67	------	------	------	17.0	------	45	27	25	−13	7	9	27	16	------	------	0.55	------	10	------	nw.	32	nw.	8	2	13	16	------	6.7	T
Williston	1,878	41	48	28.03	30.10	+.06	20.2	−2.7	52	31	29	−20	7	12	28	17	13	78	0.92	+0.2	8	6,933	nw.	40	se.	1	10	12	9	5.2	7.6	0.0
Upper Mississippi Valley							30.1	−6.0										73	1.86	−0.4										6.2		
Minneapolis	918	102	208	28.97	29.99	------	21.8	−7.8	62	29	29	−6	7	14	26	------	------	------	1.42	0.0	10	9,170	nw.	30	n.	6	4	10	17	7.2	13.4	T.
St. Paul	837	114	149	29.07	30.01	−.04	22.4	−6.7	61	29	30	−6	6	15	26	------	------	------	1.45	0.0	13	7,706	nw.	27	nw.	6	6	12	13	6.6	16.0	T.
La Crosse	714	11	48	29.19	29.99	−.05	25.0	−6.5	65	29	33	−5	6	17	34	22	18	77	1.34	−0.3	9	5,013	nw.	18	s.	29	8	8	15	6.4	12.0	0.0
Madison	974	70	78	28.88	29.98	−.06	24.4	−6.2	64	29	31	−4	7	18	32	22	18	78	1.38	−0.7	7	7,636	nw.	25	ne.	21	8	8	15	6.0	5.1	0.0
Wausau	1,247	4	62	28.57	29.96	------	21.6	------	48	30	30	−11	7	14	32	------	------	------	1.00	−0.8	7	5,883	nw.	24	w.	7	14	6	11	5.3	7.5	0.0
Charles City	1,015	10	51	28.91	30.03	−.02	24.4	−6.3	67	29	32	−5	8	17	31	21	18	78	1.97	+0.2	10	6,444	nw.	22	s.	30	7	14	10	5.8	19.1	0.0
Davenport	606	118	143	29.32	30.01	−.02	29.7	−6.4	71	29	37	1	8	22	32	26	20	71	2.58	+0.3	13	9,323	nw.	38	ne.	21	3	13	15	6.7	12.2	0.0
Des Moines	861	5	99	29.09	30.02	−.02	30.4	−5.5	73	29	39	0	8	22	33	26	21	71	1.19	−0.6	10	8,921	nw.	36	s.	29	5	15	11	6.4	6.4	0.0
Dubuque	700	81	96	29.22	30.00	−.04	27.2	−6.8	68	29	34	−2	8	20	36	24	19	74	2.73	+0.7	11	6,304	nw.	22	s.	29	12	6	13	5.7	14.5	T.
Keokuk	614	64	78	29.33	30.03	.00	32.9	−6.0	76	29	41	3	6	25	35	28	22	66	1.56	−0.8	10	7,360	nw.	27	sw.	29	9	9	13	5.9	4.8	0.0
Cairo	358	87	93	29.60	29.99	−.05	42.7	−4.8	74	21	51	11	9	34	33	38	32	69	4.19	+0.4	12	8,233	nw.	32	sw.	21	3	13	15	6.8	2.0	0.0
Peoria	609	11	45	29.32	30.01	−.02	31.8	−5.2	72	29	40	3	6	24	34	27	23	76	2.51	+0.2	8	6,848	nw.	23	s.	29	6	13	12	6.5	5.9	0.0
Springfield, Ill.	636	5	191	29.30	29.99	−.04	35.0	−5.2	74	29	44	7	7	26	33	30	25	73	1.59	−0.6	8	9,552	nw.	34	s.	29	6	11	14	6.5	3.4	0.0
Hannibal	534	74	109	29.42	30.02	.00	35.4	−5.6	75	29	44	6	6	27	35				1.68	−0.9	9	8,208	nw.	32	sw.	29	8	10	13	5.8	3.0	0.0
St. Louis	568	265	303	29.37	30.00	−.03	38.8	−5.0	74	29	48	9	9	30	34	33	26	65	1.33	−2.0	9	9,869	nw.	41	sw.	29	9	12	10	5.8	0.3	0.0
Missouri Valley							32.0	−5.6										72	1.32	−0.5										5.8		
Columbia, Mo	784	6	84	29.15	30.01	−.02	37.0	−5.6	76	29	46	8	7	28	32	------	------	------	1.16	−1.8	7	8,099	nw.	30	sw.	29	7	9	15	6.4	3.7	0.0
Kansas City	963	161	181	28.97	30.04	+.02	36.4	−6.3	73	29	45	5	8	28	34	31	25	68	2.30	−0.2	9	9,357	nw.	31	nw.	4	11	12	8	5.5	4.7	0.0
St. Joseph	967	11	49	28.96	30.03	------	34.6	------	73	29	44	2	8	25	33	29	24	71	1.52	−0.5	8	8,203	nw.	32	ne.	21	13	10	8	4.7	5.4	0.0
Springfield, Mo	1,324	98	104	28.55	29.99	−.03	40.1	−5.1	76	25	50	5	9	31	40	34	29	70	2.52	−0.9	11	8,685	nw.	32	s.	29	15	8	8	4.5	2.0	0.0
Iola	984	11	50	28.94	30.02	+.01	38.6	−5.9	76	25	49	7	10	28	38	------	------	------	1.24	−1.4	11	6,479	n.	25	s.	29	11	12	8	5.1	2.0	0.0
Topeka	987	92	107	------	------	------	35.8	−6.8	74	29	46	4	7	26	38	------	------	------	1.31	−0.8	5	8,425	nw.	35	ne.	21	10	12	9	5.9	9.9	0.0
Lincoln	1,189	11	81	28.74	30.05	+.03	32.2	−5.3	75	29	41	0	8	24	30	28	22	70	0.81	−0.5	6	8,540	nw.	34	n.	21	7	16	8	5.9	6.7	0.0
Omaha	1,105	115	122	28.83	30.05	+.01	31.4	−5.6	75	29	40	1	8	23	30	27	20	67	0.85	−0.5	7	8,244	nw.	30	nw.	9	7	14	10	6.0	5.6	0.0
Valentine	2,598	47	54	27.28	30.10	+.07	25.8	−6.5	65	28	37	−11	10	15	40	22	18	79	0.92	−0.1	13	7,413	w.	32	n.	29	4	20	7	6.0	8.7	0.0
Sioux City	1,135	94	164	28.79	30.05	.00	28.0	−4.7	73	29	36	−3	8	20	36	25	20	72	1.16	0.0	7	9,854	nw.	37	nw.	30	5	10	16	6.8	6.4	0.0
Huron	1,306	59	74	28.63	30.08	+.02	24.6	−4.3	67	29	33	−9	8	16	42	21	18	79	1.29	+0.4	12	7,710	nw.	30	nw.	8	5	13	13	6.5	6.7	0.0
Pierre	1,572	70	75	28.36	30.09	+.04	26.4	−5.1	63	31	36	−8	6	17	33	23	17	70	0.98	+0.1	8	7,930	nw.	34	nw.	29	6	15	10	6.0	10.1	0.0
Yankton	1,233	49	57	28.70	30.07	+.02	27.6	−5.6	68	29	38	−2	6	19	39	------	------	------	1.16	−0.1	6	6,876	nw.	31	nw.	29	5	10	16	6.9	10.1	0.0

TABLE 1.—*Climatological data for Weather Bureau stations, March, 1932*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours.	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with .01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
	Ft.	Ft.	Ft.	In.	In.	In.	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	°F.	%	In.	In.		Miles								0–10	In.	In.
Northern Slope							26.2	−5.2										71	1.07	+0.1										6.3		
Billings	3,140	5					25.6		64	28	38	−32	10	13	48				1.90		11		nw.									
Havre	2,505	11	67	27.40	30.14	+0.14	22.0	−5.1	62	31	31	−18	9	13	37	20	18	86	0.80	+0.3	14	6,566	sw.	29	sw.	26	5	9	16	6.7	9.1	0.0
Helena	4,124	89	113	25.78	30.11	+.10	25.2	−7.2	65	31	33	−19	9	17	29	21	14	63	1.55	+0.8	9	6,391	sw.	41	sw.	24	5	8	18	6.8	24.7	0.0
Kalispell	2,973	48	56	26.93	30.08	+.09	28.6	−4.3	58	31	36	−6	9	21	31	26	23	81	1.75	+0.8	12	4,804	nw.	21	nw.	25	5	3	23	7.5	16.8	0.0
Miles City	2,371	48	55	27.50	30.15	+.13	25.6	−3.0	62	31	34	−15	10	17	38	23	19	79	0.85	0.0	14	5,082	w.	31	w.	24	4	14	13	6.8	4.3	0.0
Rapid City	3,259	50	58	26.57	30.12	+.11	26.0	−6.6	63	28	36	−15	7	16	36	22	17	73	0.52	−0.4	8	6,298	n.	31	nw.	8	6	14	11	6.0	5.7	0.0
Cheyenne	6,088	84	101	23.90	30.05	+.09	25.8	−7.3	55	31	37	−20	12	15	48	20	13	59	1.40	+0.4	10	11,702	w.	44	w.	14	12	7	12	5.7	15.9	T.
Lander	5,372	60	68	24.58	30.04	+.05	29.9	−2.5	65	31	42	−5	9	18	40	24	16	63	0.44	−0.8	5	4,912	ne.	32	sw.	24	12	12	7	4.5	4.5	0.0
Sheridan	3,790	10	47	26.07	30.11		25.8		65	31	37	−21	11	14	52	21	15	68	1.65	+0.5	14	4,763	nw.	30	nw.	30	6	13	12	6.2	9.5	0.0
Yellowstone Park	6,241	11	48	23.80	30.13	+.11	21.6	−4.9	48	31	31	−19	11	12	44	18	12	70	1.23	−0.4	18	6,567	sw.	27	sw.	19	5	6	20	7.3	26.8	12.0
North Platte	2,821	11	51	27.04	30.06	+.06	30.9	−5.7	70	29	44	−6	10	18	44	25	19	71	0.54	−0.3	11	6,470	nw.	32	n.	29	6	17	8	5.5	4.0	0.0
Middle Slope							37.4	−6.0										61	0.72	−0.5										5.3		
Denver	5,292	106	113	24.64	30.02	+.07	33.3	−6.0	67	19	45	−5	9	22	42	26	14	52	0.83	−0.2	10	6,711	s.	35	n.	3	7	14	10	5.8	16.4	0.0
Pueblo	4,685	80	86	25.22	29.99	+.07	36.6	−5.0	74	19	51	−2	12	22	51	28	17	53	0.62	0.0	6	5,939	se.	38	w.	20	10	18	3	4.5	7.5	0.0
Concordia	1,392	50	58	28.56	30.08	+.07	34.0	−7.0	76	29	44	2	7	24	37	29	25	75	0.83	−0.4	6	7,254	n.	32	sw.	29	11	13	7	5.3	5.5	0.0
Dodge City	2,509	88	100	27.39	30.06	+.09	36.6	−6.2	78	29	48	4	7	25	44	30	23	65	0.91	0.0	10	9,605	nw.	43	n.	4	15	8	8	4.6	4.6	0.0
Wichita	1,358	139	158	28.56	30.02	+.03	38.1	−7.0	72	31	48	5	10	28	36	32	24	64	0.77	−1.0	8	9,433	n.	47	sw.	29	10	7	14	6.1	6.5	0.0
Oklahoma City	1,214	10	47	28.70	30.01	+.03	45.5	−4.5	84	25	58	11	9	33	39	36	27	57	0.39	−1.6	3	8,708	n.	30	nw.	4	13	4	14	5.3	T.	0.0
Southern Slope							50.2	−4.4										48	0.73	−0.2										4.2		
Abilene	1,738	10	52	28.18	30.00	+.04	52.0	−4.5	88	25	65	20	9	39	39	40	27	48	0.10	−1.2	2	8,555	s.	32	nw.	21	15	8	8	4.0	T.	0.0
Amarillo	3,676	10	49	26.21	29.98	+.04	44.0	−2.9	82	20	58	10	12	30	50	33	21	49	0.42	−0.3	7	6,968	sw.	27	nw.	21	14	8	9	4.4	5.0	0.0
Big Spring	2,537	5	62				49.4		89	20	64	18	11	35	43				0.20		2		s.				15	8	8	4.0	2.5	0.0
Del Rio	944	64	71	28.98	29.97	+.02	59.0	−4.5	96	20	72	25	13	46	41	47	34	48	1.03	+0.3	5	7,263	se.	44	n.	4	10	13	8	5.2	0.1	0.0
Roswell	3,566	75	85	26.33	29.97	+.07	45.8	−5.5	82	19	60	3	13	31	44	36	24	51	1.38	+0.6	6	6,983	sw.	49	sw.	20	19	5	7	3.6	7.9	0.0
Southern Plateau							51.2	+0.5										46	0.10	−0.4										3.0		
El Paso	3,778	152	175	26.15	29.94	+.06	52.2	−3.6	79	25	66	21	13	39	40	40	24	39	0.03	−0.3	2	9,498	w.	57	sw.	20	19	10	2	2.5	T.	0.0
Albuquerque	4,972	51	66	24.98	29.90		43.8		74	19	57	19	13	30	41	34	22	50	0.27		7	4,582	ne.	36	w.	20	11	15	5	4.3	2.4	0.0
Santa Fe	7,013	38	53	23.14	29.93	+.04	36.7	−3.0	64	19	48	12	9	26	36	29	20	55	0.41	−0.4	6	5,939	n.	30	sw.	20	11	14	6	4.7	3.2	0.0
Flagstaff	6,907	10	59	23.28	29.90	−.01	36.9	+1.0	66	31	51	0	4	23	44	31		69	0.44		4	6,769	nw.	33	nw.	20	12	13	6		3.2	0.0
Phoenix	1,108	10	107	28.77	29.93	+.02	61.9	+1.2	87	19	76	36	5	48	40	47	31	37	0.05	−0.6	1	5,122	e.	29	w.	20	22	6	3	2.2	0.0	0.0
Yuma	141	9	54	29.81	29.96	+.02	65.8	+1.7	92	19	81	41	6	51	43	51	32	35	0.00	−0.3	0	5,071	n.	31	nw.	20	26	5	0	1.3	0.0	0.0
Independence	3,957	6	27	25.99	30.03	+.09	54.0	+5.5	80	19	70	29	4	38	39	38			T.	−0.5	0		n.				23	2	6		0.0	0.0
Middle Plateau							41.2	+0.3										54	0.75	−0.4										5.9		
Reno	4,532	74	81	25.51	30.08	+.10	45.0	+4.0	70	30	57	22	4	32	38	36	26	52	0.20	−0.6	1	6,007	w.	46	w.	28	11	13	7	4.7	0.2	0.0
Tonopah	6,090	12	20				41.2		66	31	51	17	4	31	29	33	22	50	T.		0		nw.									
Winnemucca	4,344	18	56	25.67	30.11	+.10	40.9	+0.9	73	31	52	15	4	30	41	35	28	65	1.04	+0.1	9	6,575	sw.	32	w.	28	6	15	10	6.0	0.1	0.0
Modena	5,473	10	43	24.60	29.98	+.02	39.3	+1.1	69	31	52	16	13	26	44	32	22	54	0.26	−0.8	3	6,934	w.	36	nw.	20	7	16	8	5.5	1.6	0.0
Salt Lake City	4,360	163	203	25.64	30.06	+.08	39.9	−1.8	67	31	47	17	4	33	28	34	26	58	1.51	−0.5	14	5,482	nw.	32	nw.	20	2	11	18	7.5	5.0	0.0
Grand Junction	4,602	60	68	25.34	29.94	.00	40.9	−2.7	70	19	52	16	12	29	37	32	20	48	0.70	0.0	10	4,930	nw.	33	sw.	20	7	14	10	5.6	2.2	0.0
Northern Plateau							40.6	−1.2										68	2.06	+0.9										7.6		
Baker	3,471	48	53	26.48	30.13	+.10	36.4	−1.2	63	31	44	15	4	29	27	33	28	74	1.74	+0.6	16	4,682	se.	28	sw.	24	3	7	21	7.7	6.6	0.0
Boise	2,739	79	87	27.23	30.13	+.10	40.8	−1.9	70	31	48	22	13	33	31	36	30	66	2.93	+1.6	15	4,758	se.	23	se.	8	2	7	22	8.1	1.6	0.0
Lewiston	757	40	48	29.26	30.08	+.05	45.1	−0.3	66	31	53	28	9	38	27				2.14	+1.0	11	4,336	e.	27	sw.	24	3	6	22	8.1	3.8	0.0
Pocatello	4,477	60	68	25.47	30.09	+.08	34.1	−3.3	58	31	42	7	12	27	29	30	26	74	0.99	−0.3	11	8,077	sw.	35	sw.	6	3	9	19	7.0	5.7	0.0
Spokane	1,929	101	110	27.98	30.07	+.06	38.2	−1.5	65	31	46	13	11	31	30	34	28	70	2.69	+1.5	15	5,713	s.	31	sw.	24	5	8	18	7.2	12.5	0.0
Walla Walla	991	57	65	29.00	30.08	+.06	45.6	−0.5	72	31	53	26	11	38	28	40	35	67	3.43	+1.8	18	5,173	s.	30	w.	24	5	5	21	7.7	3.3	0.0
Yakima	1,076	58	67	28.91	30.07		44.2	+0.1	72	31	54	25	12	35	28	38	29	58	0.49	+0.1	9	4,929	nw.	34	sw.	24	2	12	17	7.5	2.0	0.0
North Pacific Coast Region							46.8	+1.6										78	5.83	+1.9										8.6		
North Head	211	11	56	29.84	30.07	+.06	45.6	+0.4	57	8	49	35	3	42	15	43	40	84	8.81	+3.2	24	13,760	s.	49	s.	23	0	4	27	9.1	0.0	0.0
Port Angeles	29	8	53		30.04		44.8		57	31	50	31	3	40	18				1.93	−0.3	19	4,989	s.	27	w.	20	1	14	16		T.	0.0
Seattle	125	215	250	29.91	30.04	+.05	46.4	+1.5	63	12	52	31	3	41	22	42	37	73	3.55	+0.5	24	8,212	s.	41	sw.	24	0	6	25	8.7	1.8	0.0
Tacoma	194	172	201	29.84	30.06	+.06	46.6	+2.4	62	12	52	29	3	41	23				6.09	+2.6	20	7,066	s.	42	sw.	24	0	6	25	8.9	T.	0.0
Tatoosh Island	86	9	53	29.90	30.00	+.04	44.4	+1.5	54	11	48	36	1	41	12	43	42	89	13.94	+6.1	24	13,739	e.	57	e.	8	1	7	23	8.4	0.0	0.0
Medford	1,329	29	58	28.70	30.13		47.7		75	31	58	22	3	37	40	43	38	72	2.43	+0.7	15	4,260	nw.	24	se.	8	2	9	20	8.1	T.	0.0
Portland, Oreg	153	68	106	29.94	30.10	+.08	48.0	+1.1	67	30	54	31	3	42	22	44	39	74	6.08	+2.2	24	6,216	sw.	30	e.	8	0	4	27	9.1	T.	0.0
Roseburg	510	75	99	29.58	30.14	+.10	50.0	+2.9	77	31	58	28	3	42	38	46	41	74	3.79	+0.5	17	3,615	sw.	24	sw.	24	1	12	18	7.8	0.0	0.0
Middle Pacific Coast Region							55.6	+2.7										70	1.42	−1.9										5.1		
Eureka	62	73	89	30.12	30.19	+.13	50.4	+2.1	65	12	56	32	3	44	28	48	45	85	4.54	−0.7	17	5,465	n.	30	sw.	31	5	11	15	7.0	0.0	0.0
Red Bluff	330	5	58	29.74	30.10	+.06	57.4	+3.8	83	30	68	40	4	46	34	49	39	56	0.92	−2.3	7	5,164	nw.	23	w.	2	10	10	11	5.4	0.0	0.0
Sacramento	69	106	117	30.02	30.09	+.06	57.1	+2.8	78	31	68	37	4	46	30	51	46	60	0.34	−2.2	7	6,054	se.	27	nw.	3	18	8	5	3.0	0.0	0.0
San Francisco	155	208	243	29.94	30.11	+.05	57.1	+2.9	77	30	64	45	6	50	26	50	45	71	0.86	−2.3	6	4,748	w.	32	nw.	28	10	11	10	5.2	0.0	0.0
San Jose	141	12	110	29.97	30.12		55.8	+2.1	80	31	68	34	4	44	38				0.45	−2.2	4	4,681	nw.	25	sw.	13	13	9	9	5.1	0.0	0.0
South Pacific Coast Region							59.9	+3.5										63	0.42	−1.6										3.7		
Fresno	327	89	98	29.73	30.09	+.08	58.4	+3.4	86	31	70	39	1	47	33	50	42	60	0.83	−0.8	1	5,155	nw.	32	nw.	20	17	7	7	4.2	0.0	0.0
Los Angeles	338	159	191	29.67	30.04	+.02	62.2	+4.7	86	26	72	48	7	53	30	52	43	59	0.01	−2.8	1	4,431	sw.	28	nw.	20	20	7	4	3.0	0.0	0.0
San Diego	87	62	70	29.94	30.03	+.01	59.0	+2.3	77	27	66	44	21	52	25	53	48	70	0.42	−1.3	2	4,576	w.	21	w.	20	16	10	5	3.9	0.0	0.0
West Indies																																
San Juan, P. R	82	9	54	29.89	29.98		76.6	+1.2	89	6	82	67	5	71	20				1.08	−2.1	10	8,357	e.	32	ne.	30	11	16	4	4.5	0.0	0.0
Panama Canal																																
Balboa Heights	118	6	97		[1]29.84	.00	80.9	−0.3	93	13	90	68	2	72	22			[1]75	0.13	−0.6	1	6,505	n.	25	n.	30	1	30	0	5.5	0.0	0.0
Cristobal	36	6	97		[1]29.86	−.01	81.6	+0.1	91	5	86	72	2	77	18	74	72	[1]76	2.69	+1.1	12	8,796	n.	27	n.	14	10	16	5	5.1	0.0	0.0
Alaska																																
Fairbanks	455	11	44	[2]29.35	[2]29.90		13.6		48	23	29	−34	1	−2	42	14	7	68	0.10		1	3,080	n.	15	ne.	12	7	14	10	5.5	2.8	20.5
Juneau	80	11	50	[2]29.82	[2]29.91		33.7		46	26	38	15	2	30	19	31	24	69	2.82		21	5,761	s.	28	se.	3	6	3	22	7.5	7.4	0.0
Hawaiian Islands																																
Honolulu	38	86	100	[2]29.99	[2]30.03		71.9	+0.5	79	24	77	58	7	67	16	65	62	73	3.05	−0.2	13	6,731	e.	25	e.	27	12	9	10	5.3	0.0	0.0

[1] Observations taken bihourly.

[2] Pressure not reduced to mean of 24 hours.

TABLE 2.—*Data furnished by the Canadian Meteorological Service, March, 1932*

Stations	Altitude above mean sea level, Jan. 1, 1919	Pressure: Station reduced to mean of 24 hours	Pressure: Sea level reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max.+ mean min.÷2	Temperature of the air: Departure from normal	Temperature of the air: Mean maximum	Temperature of the air: Mean minimum	Temperature of the air: Highest	Temperature of the air: Lowest	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Total snowfall
	Feet	*Inches*	*Inches*	*Inches*	°F.	°F.	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*
Cape Race, N. F.	99				28.7		32.8	24.6	42	6	7.42		25.0
Sydney, C. B. I.	48	29.47	29.52	−0.36	28.6	+2.4	35.3	21.9	48	4	5.12	+0.19	7.0
Halifax, N. S.	88	29.44	29.55	−.39	30.7	+1.7	37.3	24.0	54	9	2.98	−2.48	4.5
Yarmouth, N. S.	65	29.48	29.55	−.40	31.5	+0.7	37.3	25.8	51	14	3.10	−1.90	6.8
Charlottetown, P. E. I.	38	29.44	29.48	−.42	26.0	+0.6	32.0	20.0	46	6	3.56	+0.35	19.8
Chatham, N. B.	28	29.44	29.47	−.43	24.8	+1.8	34.6	15.0	52	−3	3.23	−0.24	19.4
Father Point, Que.	20												
Quebec, Que.	296	29.37	29.70	−.26	20.2	−1.0	27.0	13.4	41	−4	4.20	+0.94	33.3
Doucet, Que.	1,236				7.8		22.8	−7.1	44	−32	2.97		25.1
Montreal, Que.	187	29.53	29.75	−.25	23.2	−0.6	29.0	17.4	44	3	5.94	+2.15	45.4
Ottawa, Ont.	236	29.52	29.79	−.22	24.0	+2.5	32.4	15.7	47	−1	2.81	+0.09	24.3
Kingston, Ont.	285	29.48	29.80	−.21	26.6	+1.0	33.1	20.0	47	−2	3.03	+0.39	23.0
Toronto, Ont.	379	29.43	29.86	−.16	29.2	+1.9	34.8	23.5	58	5	1.60	−1.04	14.5
Cochrane, Ont.	930				12.0		21.0	3.0	44	−17	1.92		18.3
White River, Ont.	1,244	28.51	29.88	−.15	9.0	−3.2	22.3	−4.2	39	−36	2.23	+0.85	22.3
London, Ont.	808												
Southampton, Ont.	656	29.12	29.85	−.18	26.5	+1.8	32.9	20.1	57	5	3.44	+0.79	26.2
Parry Sound, Ont.	688	29.13	29.84	−.18	22.6	+1.5	30.9	14.4	54	−5	4.40	+2.17	35.0
Port Arthur, Ont.	644	29.19	29.92	−.13	17.9	+1.1	27.0	8.8	37	−9	1.56	+0.59	15.6
Winnipeg, Man.	760												
Minnedosa, Man.	1,690	28.18	30.10	+.04	10.2	−2.3	20.0	0.5	42	−25	1.73	+1.08	17.3
Le Pas, Man.	860				2.2		15.6	−11.1	29	−32	0.55		5.5
Qu'Appelle, Sask.	2,115	27.72	30.08	+.04	11.8	−3.1	21.1	2.5	46	−26	1.26	+0.49	12.6
Moose Jaw, Sask.	1,759				15.4		25.6	5.2	49	−30	1.02		9.2
Swift Current, Sask.	2,392	27.43	30.07	+.05	18.1	−3.9	26.3	9.8	50	−23	0.58	−0.23	4.2
Medicine Hat, Alb.	2,365	27.53	30.11	+.11	18.7	−8.8	26.8	10.7	52	−26	0.52	−0.24	3.8
Calgary, Alb.	3,540	26.26	30.10	+.15	16.8	−9.4	24.4	9.2	50	−22	1.06	+0.34	10.6
Banff, Alb.	4,521	25.28	30.01	+.07	23.0	+2.8	33.3	12.6	48	−22	0.58	−0.83	5.4
Prince Albert, Sask.	1,450	28.53	30.20	+.12	6.9	−5.1	19.1	−5.3	39	−36	0.93	+0.16	9.3
Battleford, Sask.	1,592	28.34	30.19	+.13	6.1	−7.0	16.8	−4.7	37	−36	0.16	−0.30	1.6
Edmonton, Alb.	2,150	27.71	30.11	+.15	12.8	−11.4	22.6	3.0	50	−30	0.89	+0.17	8.9
Kamloops, B. C.	1,262												
Victoria, B. C.	230	29.77	30.03	+.06	45.0	+3.1	49.2	40.8	59	31	3.95	+0.83	0.9
Barkerville, B. C.	4,180												
Estevan Point, B. C.	20												
Prince Rupert, B. C.	170												
Hamilton, Ber.	151												

LATE REPORTS, 1931, VARIOUS MONTHS

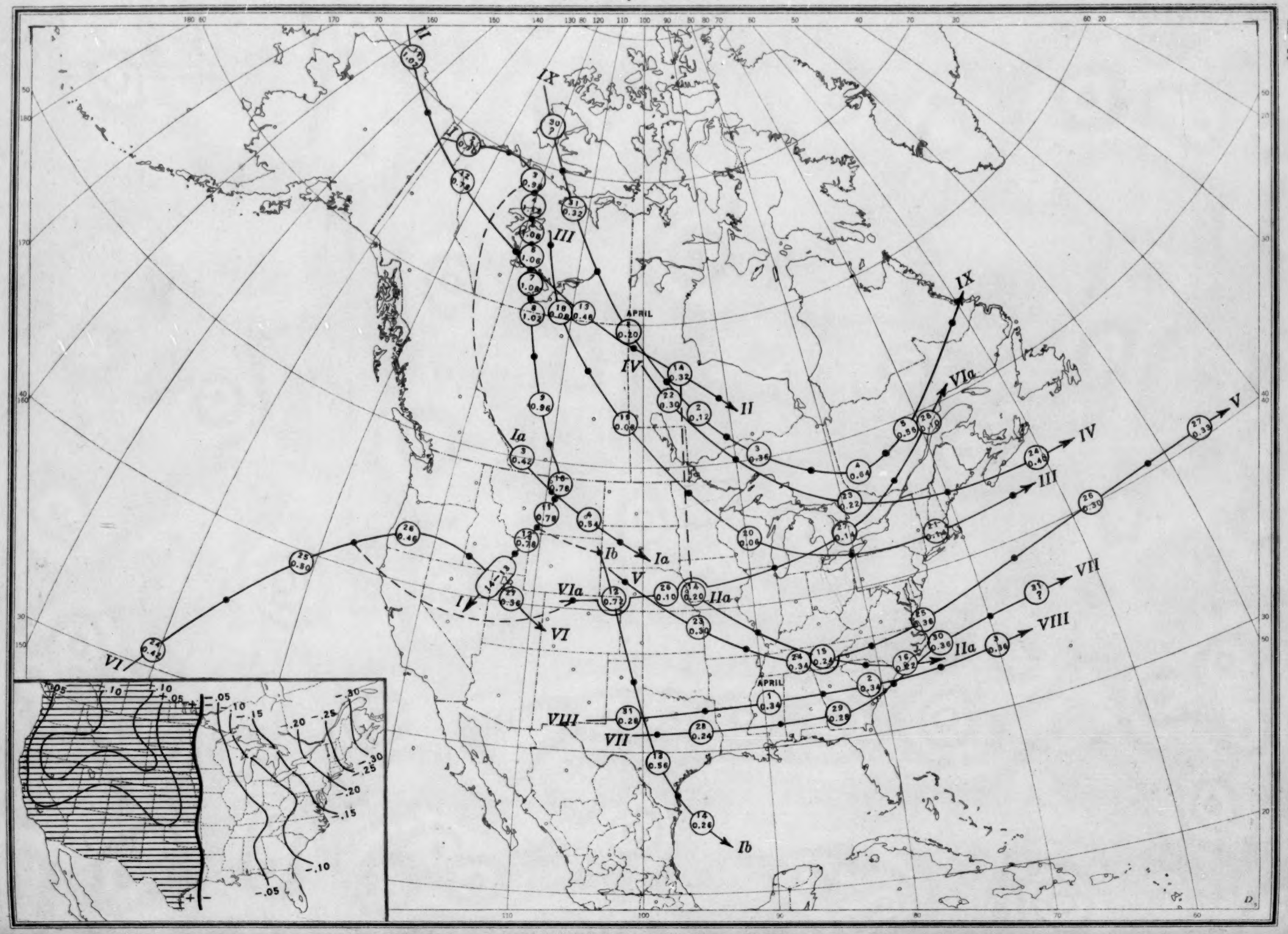
Sydney, C. B. I. (November)	48	30.00	30.05	+0.10	41.9	+4.8	48.6	35.2	66	24	1.38	−4.06	T.
Halifax, N. S. (November)	88	29.97	30.08	+.07	42.7	+5.4	49.4	36.0	66	20	2.08	−3.58	0.1
Yarmouth, N. S. (November)	65	29.99	30.06	+.04	44.5	+4.6	50.6	38.4	60	24	1.10	−3.39	T.
Charlottetown, P. E. I. (November)	38	29.94	29.98	+.02	41.9	+6.4	47.1	36.7	62	22	1.29	−2.68	1.2
Chatham, N. B. (November)	28	29.92	29.95	−.02	39.6	+8.6	48.0	31.3	70	11	1.51	−2.24	0.0
Father Point, Que. (October)	20	29.85	29.87	−.08	44.1	+4.3	50.5	37.7	72	30	2.67	−0.23	0.0
Father Point, Que. (November)		29.93	29.95	−.01	37.2	+8.3	43.7	30.8	63	16	2.22	−0.89	0.8
Winnipeg, Man. (November)	760	29.12	29.98	−.06	30.3	+12.3	37.5	23.2	66	−1	1.17	+0.09	8.2
Medicine Hat, Alb. (November)	2,365	27.45	30.00	.00	24.6	−2.8	34.3	15.0	70	−16	1.34	+0.42	9.0
Calgary, Alb. (November)	3,540	26.21	30.01	+.03	23.8	−2.0	33.4	14.2	67	−16	0.32	−0.56	3.2
Banff, Alb. (November)	4,521	25.29	30.05	+.09	20.2	−5.6	27.7	12.7	51	−17	1.50	−0.77	8.4
Edmonton, Alb. (November)	2,150	27.58	29.93	−.04	22.9	0.0	32.0	13.7	74	−17	0.70	+0.12	7.0
Edmonton, Alb. (December)		27.44	29.81	−.12	15.7	+2.6	23.6	7.9	50	−13	1.05	+0.35	10.5
Kamloops, B. C. (November)	1,262	28.77	30.10	+.14	29.4	−4.0	34.7	24.2	65	8	0.89	−0.57	8.0
Estevan Point, B. C. (November)	20				41.5		47.9	35.2	58	26	10.22		0.0
Prince Rupert, B. C. (November)	170				37.9		42.9	33.0	54	22	9.47		T.
Hamilton, Ber. (January)	151	29.95	30.12	−.01	59.8	−2.2	67.6	52.0	73	47	7.92	+2.98	0.0
Hamilton, Ber. (February)		29.85	30.02	−.09	61.2	−0.3	66.9	55.5	73	49	9.42	+4.98	0.0
Hamilton, Ber. (March)		29.77	29.94	−.14	62.2	0.0	68.2	56.2	73	51	5.29	+0.16	0.0
Hamilton, Ber. (June)		29.94	30.10	−.02	74.9	−0.1	81.1	68.7	86	64	2.61	−3.34	0.0
Hamilton, Ber. (July)		29.98	30.14	.00	79.9	+1.2	85.9	74.0	90	66	2.27	−2.17	0.0

Chart I. Departure (°F.) of the Mean Temperature from the Normal, March, 1932

Chart I. Departure (°F.) of the Mean Temperature from the Normal, March, 1932

Chart II. Tracks of Centers of Anticyclones, March, 1932. (Inset) Departure of Monthly Mean Pressure from Normal

(Plotted by G. E. Dunn)



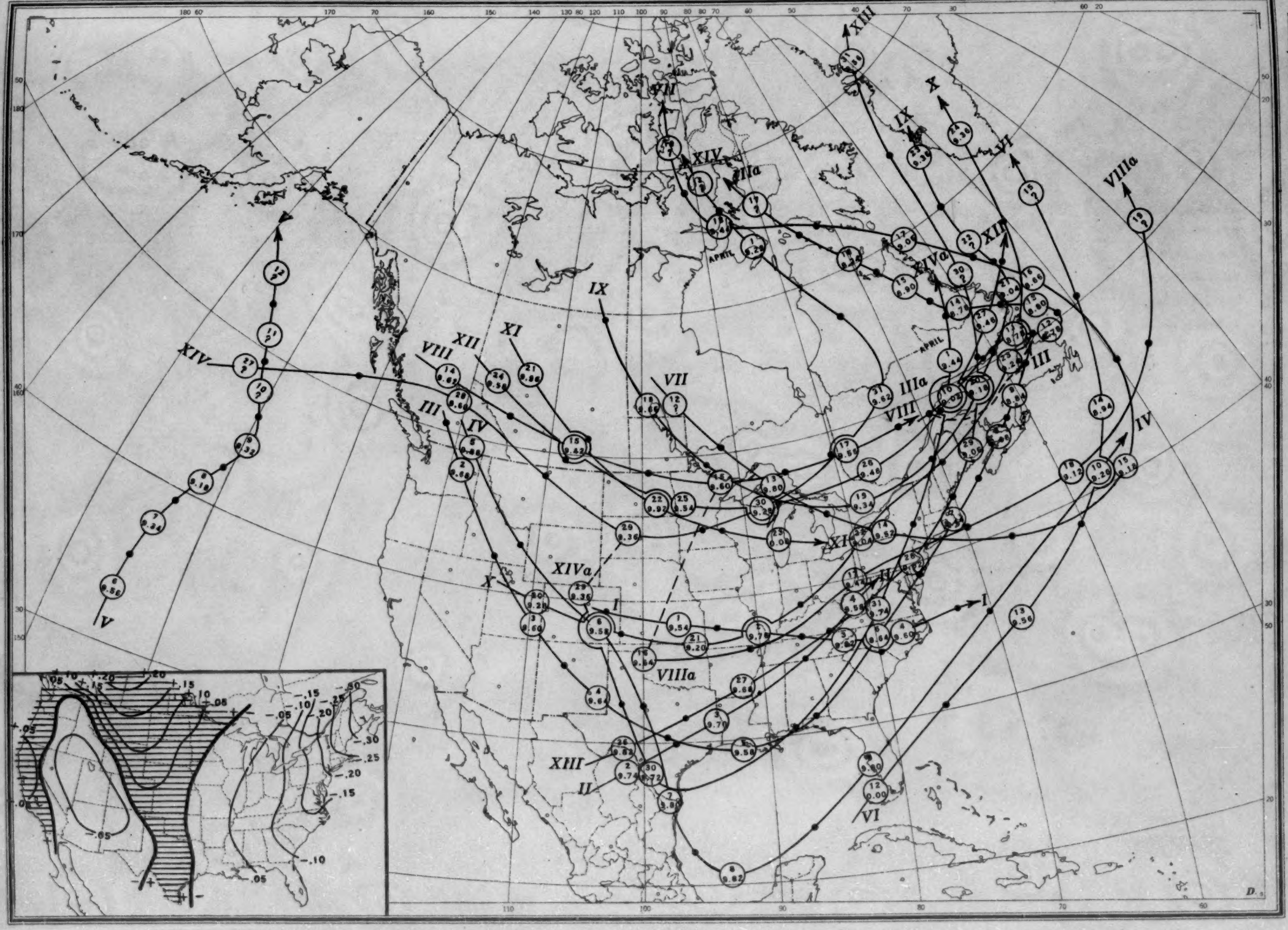
Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 8 p. m. (75th meridian time).

Chart III. Tracks of Centers of Cyclones, March, 1932. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by G. E. Dunn)

Chart III. Tracks of Centers of Cyclones, March, 1932. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by G. E. Dunn)



Circle indicates position of cyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 8 p. m. (75th meridian time).

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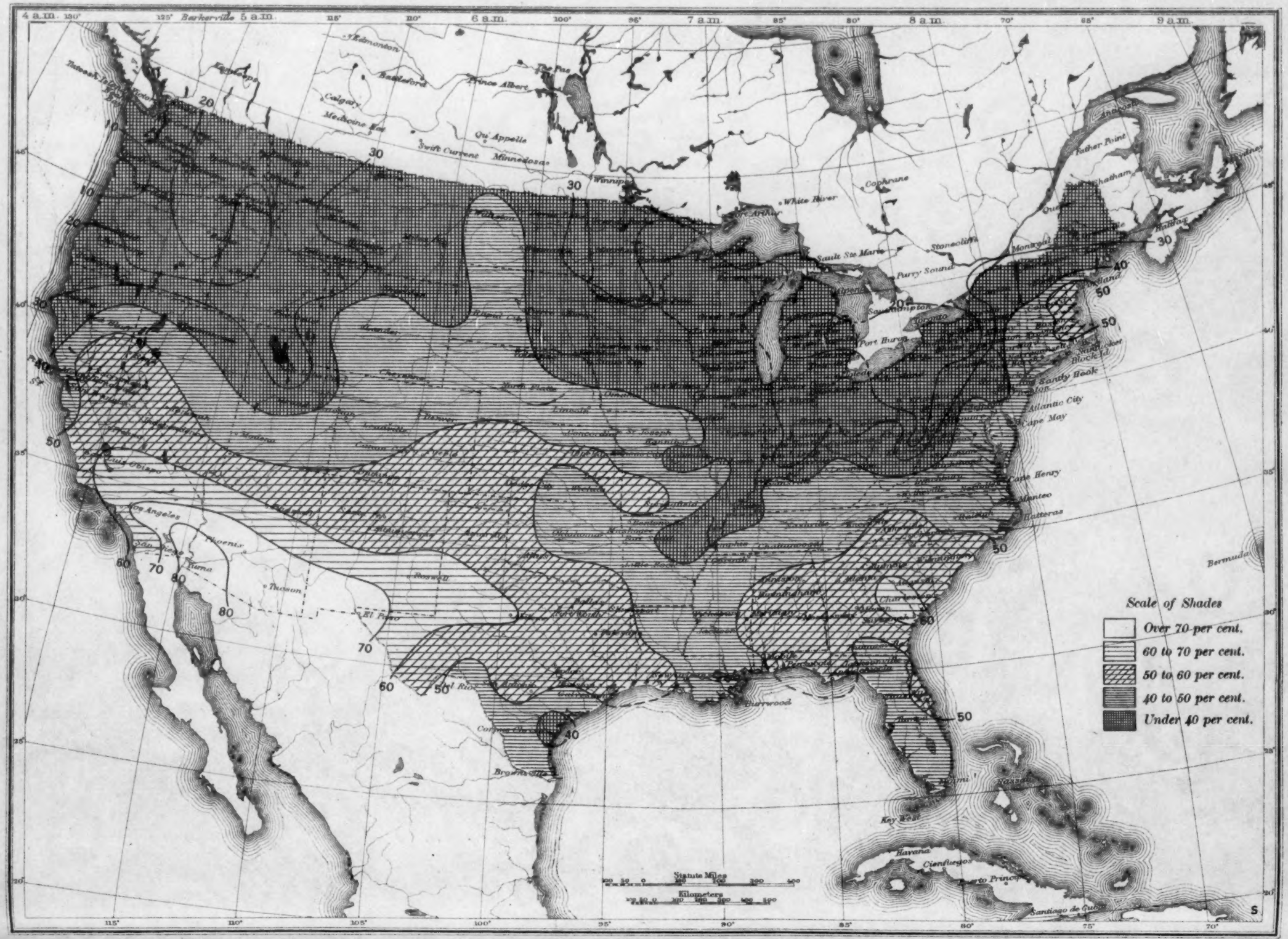
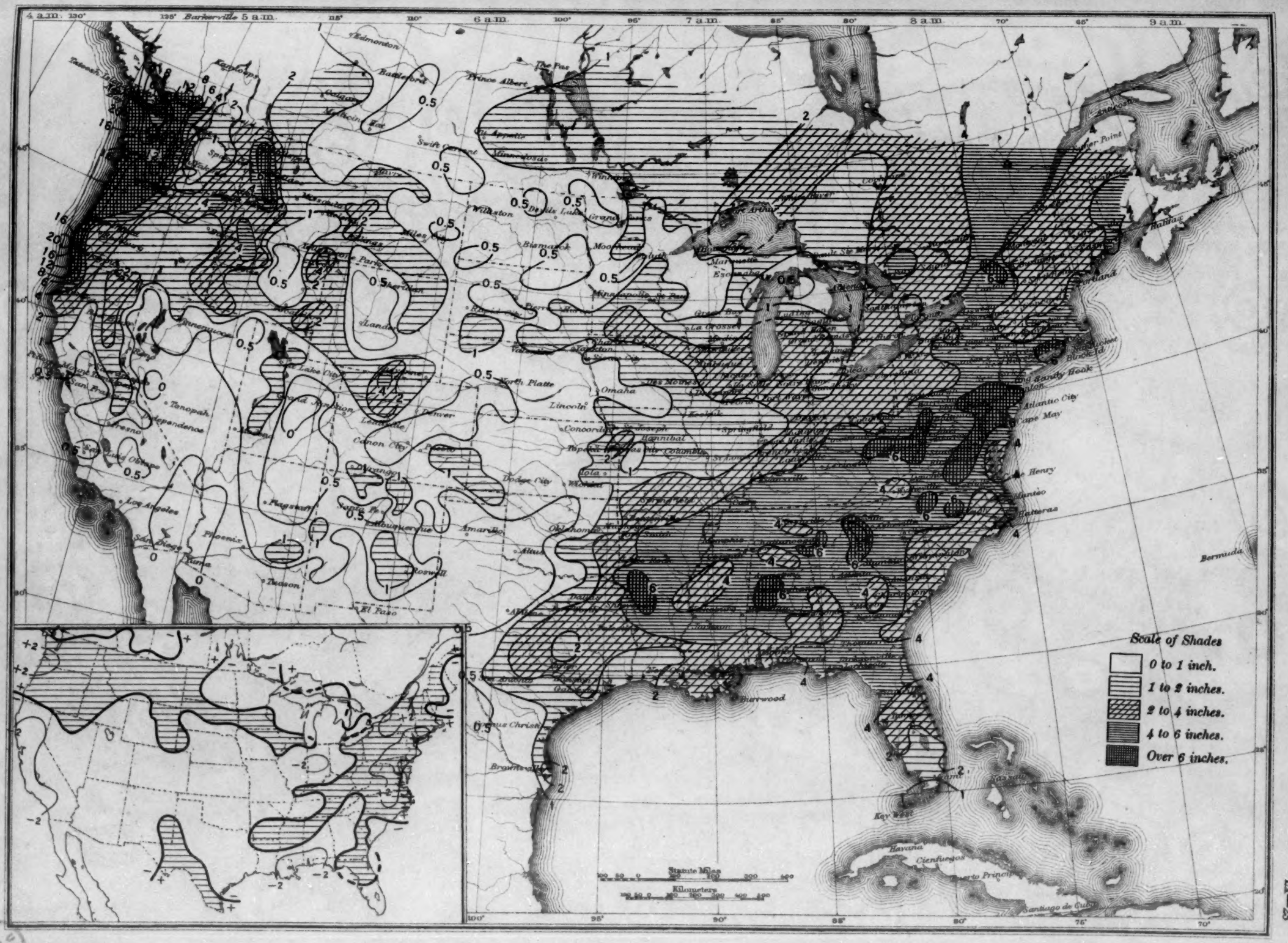
Chart IV. Percentage of Clear Sky between Sunrise and Sunset, March, 1932



March, 1932. M.W.R.

Chart V. Total Precipitation, Inches, March, 1932. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, March, 1932. (Inset) Departure of Precipitation from Normal



March, 1932. M. W. R.

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Chart VI. Isobars at Sea level and Isotherms at Surface; Prevailing Winds, March, 1932

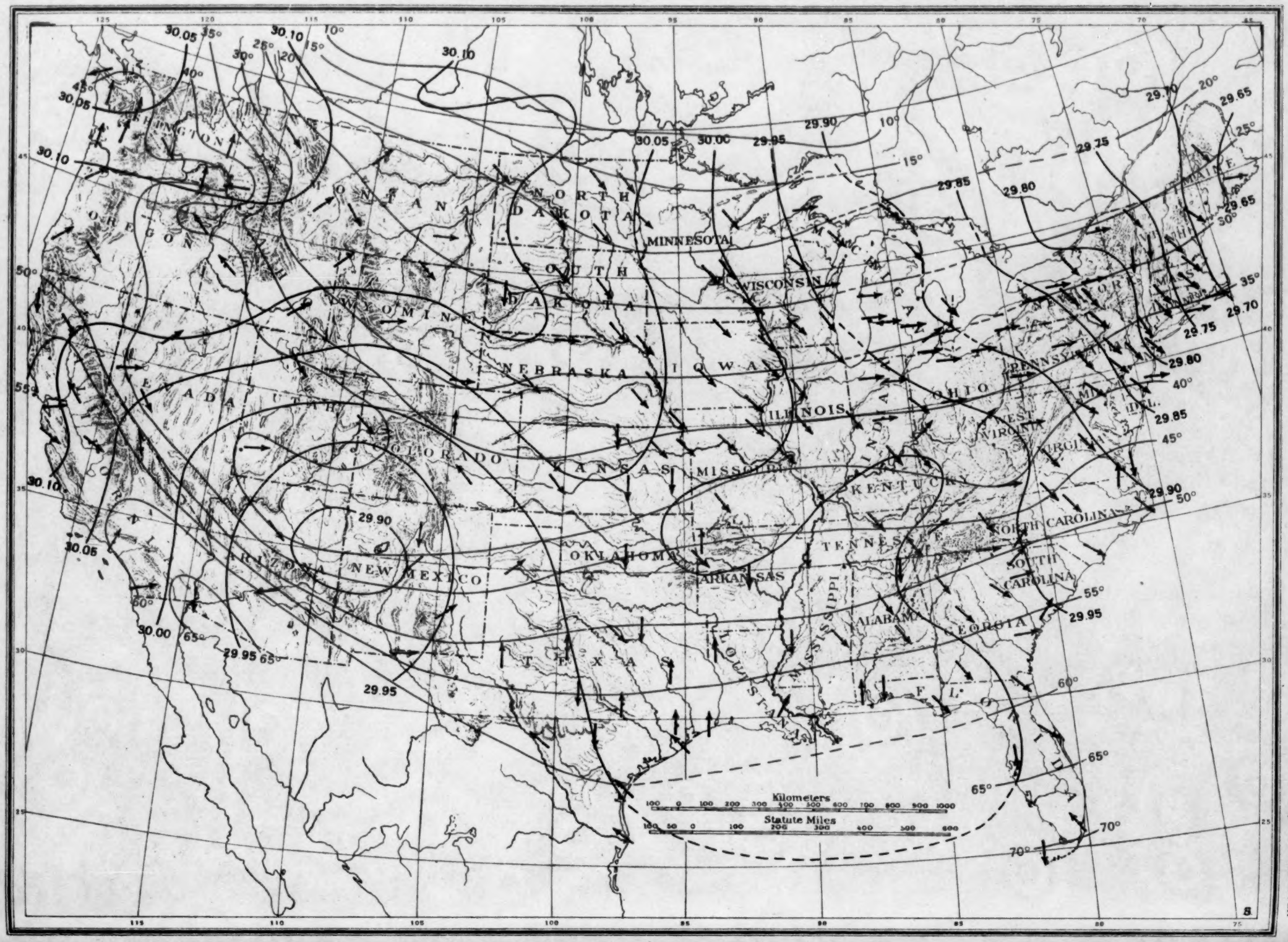

Chart VII. Total Snowfall, Inches, March, 1932

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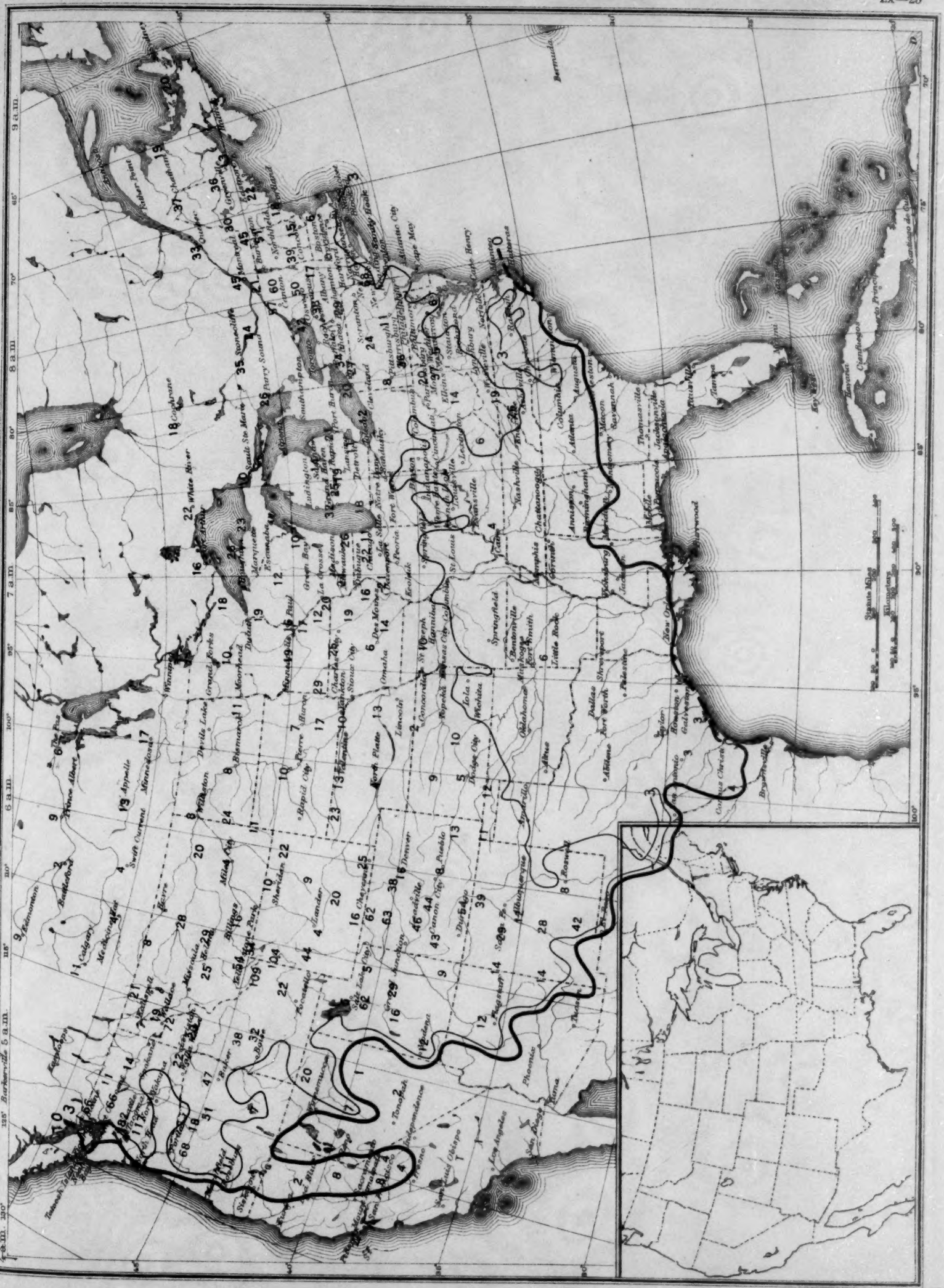

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Chart VIII. Weather Map of North Atlantic Ocean, March 5, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

Chart VIII. Weather Map of North Atlantic Ocean, March 5, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

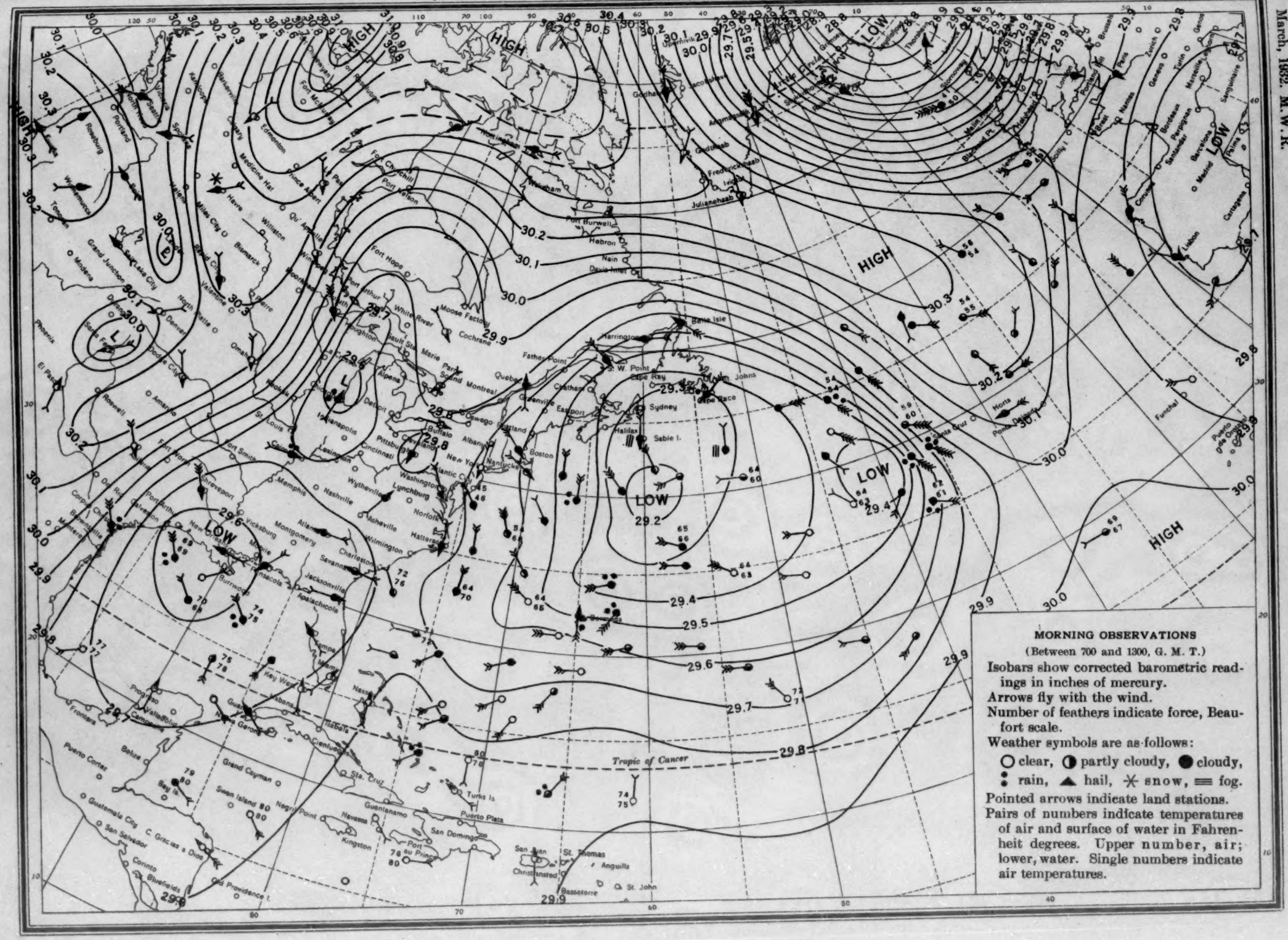
HIGH
LOW
HIGH
LOW
HIGH
LOW
HIGH
Tropic of Cancer
MORNING OBSERVATIONS
(Between 700 and 1300, G. M. T.)
Isobars show corrected barometric readings in inches of mercury.
Arrows fly with the wind.
Number of feathers indicate force, Beaufort scale.
Weather symbols are as follows:
○ clear, ◑ partly cloudy, ● cloudy,
⋮ rain, ▲ hail, ✳ snow, ═ fog.
Pointed arrows indicate land stations.
Pairs of numbers indicate temperatures of air and surface of water in Fahrenheit degrees. Upper number, air; lower, water. Single numbers indicate air temperatures.

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Chart IX. Weather Map of North Atlantic Ocean, March 6, 1932
(Plotted from the Weather Bureau Northern Hemisphere Chart)

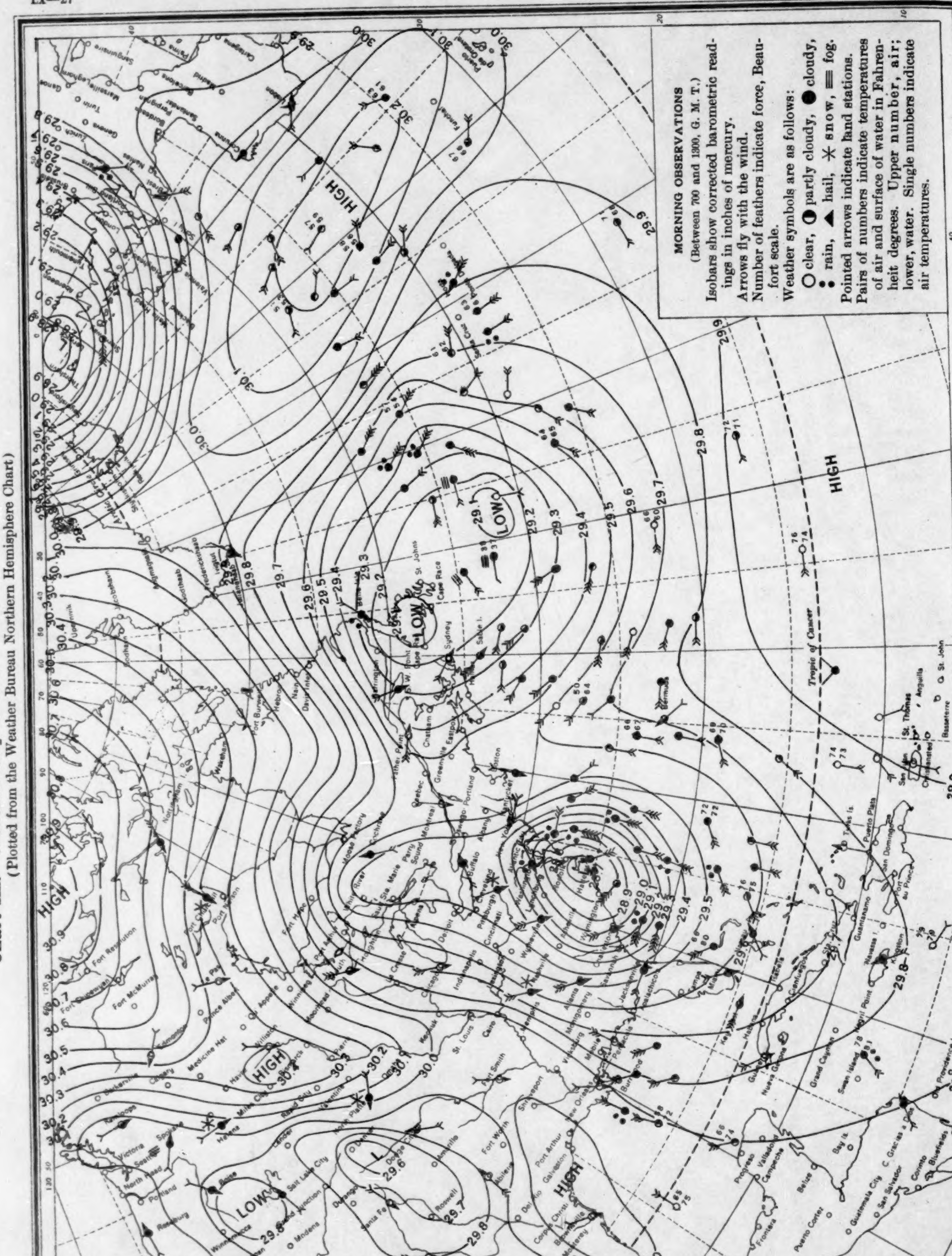
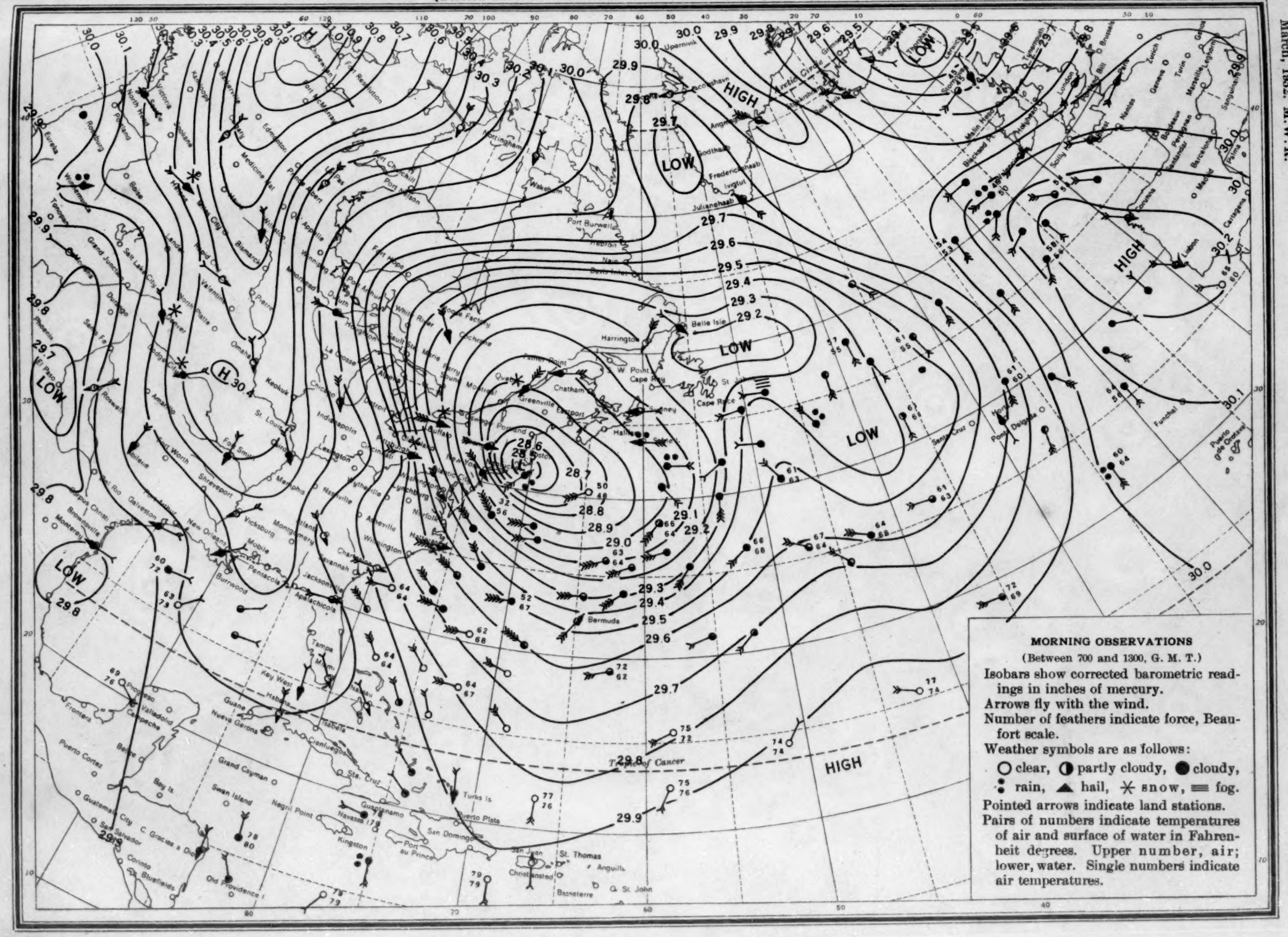


Chart X. Weather Map of North Atlantic Ocean, March 7, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)



MORNING OBSERVATIONS

(Between 700 and 1300, G. M. T.)

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Arrows fly with the wind.

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Weather symbols are as follows:

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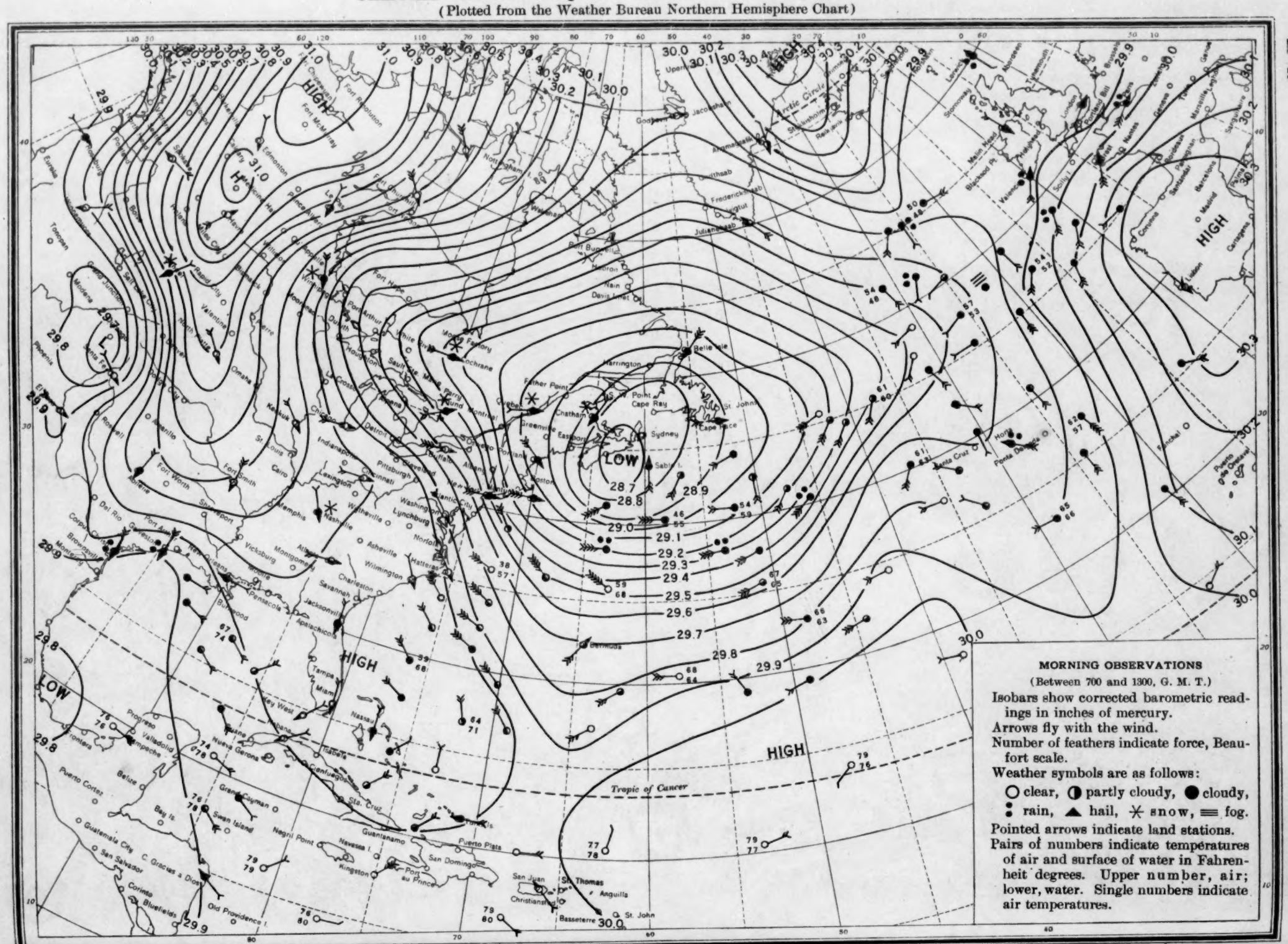
Pointed arrows indicate land stations.

Pairs of numbers indicate temperatures of air and surface of water in Fahrenheit degrees. Upper number, air; lower, water. Single numbers indicate air temperatures.

Chart XI. Weather Map of North Atlantic Ocean, March 8, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)